How many
GENERAL HOSPITAL BEDS
are needed?

A Reappraisal of Bed Needs in Relation to Population

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Foreword

Basic to all community planning for hospital services are standards of the number of hospital beds per unit of population required for the provision of adequate health care. The Hospital Survey and Construction Act, under which Federal aid is provided to the States for hospital construction, sets forth certain limits beyond which Federal aid is not available for construction. For general and chronic disease hospitals, these limits are 4.5–5.5 general beds (depending upon State population density) and 2 chronic disease beds, respectively, per 1,000 population. These bed-population ratios have become important elements in the State plans of hospital construction.

The population's need for hospital service, as expressed in terms of beds required, is not something which remains fixed or static. Rather, this need is constantly changing as a result of changes in the incidence and prevalence of illness, the accepted techniques of medical diagnosis and treatment, the practices of physicians and the public in the use of hospitals, the nature of hospitals and hospital care, the composition of the population, and many other factors.

Good planning requires constant reappraisal of the prevailing standards of hospital-bed needs in the light of all the factors which are constantly impinging upon and affecting the need.

The present publication endeavors to make such a reappraisal of general (including chronic) hospital-bed needs. As such it is hoped that it will be useful to all concerned with community planning for hospital service.

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The study was initiated as a cooperative effort of the two authors. Some months after the project was started Miss Hollingsworth left the Division of Medical and Hospital Resources for her present work and Dr. Reed brought the study to completion. As the report now stands, Chapter 2 is largely the work of Miss Hollingsworth and the remainder is almost entirely the work of Dr. Reed.

Contents

I. Introduction

The purpose of this paper is to examine once again the available data on the number of general hospital beds needed in this country and to come to a conclusion as to the number of such beds required to meet the true need for hospital care.

This is something that has been done, with more or less care and thoroughness, many times in the past, and will undoubtedly be done again and again in the future. For the need for general hospital beds—generally expressed in terms of so many beds per 1,000 population—is not something that once ascertained, if indeed it ever can be estimated precisely, remains fixed for all time. The need varies with changes in the state of the medical arts, the habits and attitudes of the medical profession and the public, the character and functions of hospitals, and with many other factors.

There is especial need at this time for a fresh examination of the question of the number of general hospital beds needed for two reasons. The first is that for the past several years hospital construction in this country has been proceeding at a pace never before matched. In 1951, for example, the value of "work put in place" on hospital construction projects amounted to $914,000,000; in 1950, to $812,000,000; in 1949, to $679,000,000. In terms of physical volume of construction, after allowance is made for changes in the value of the dollar, the construction during these years is considerably greater than in any other 3-year period in the Nation's history. The scale of present construction has led some to question whether the country is not overbuilding its hospital plant.

The second factor which especially prompts reexamination at this time is the effect of the program of Federal aid for hospital construction upon hospital planning.

The Hospital Survey and Construction (Hill-Burton) Act, as enacted in 1946, set forth specific limits beyond which the Federal Government would not participate in hospital construction in any State. For general hospitals the "ceiling" varies with the population density of the State as follows:

State population density—persons per square mile	Beds per 1,000 population
12 or more persons	4.5
Over 6, less than 12	5.0
6 or less	5.5

For chronic disease hospitals, the level of beds beyond which the Federal Government will not provide aid for construction is fixed at 2 beds per 1,000 population.[1]

These ceilings for Federal participation in construction, which in general represented the consensus as to bed needs at the time the Act was being considered, have had a strong effect upon plans developed in each State for hospital construction. Intended as the limits for Federal participation, the ceilings have, through the force of Federal regulations and instructions to State agencies, tended to become established as definite and fixed standards of bed needs. Such use of fixed standards, seemingly endowed with Federal authority, for the measuring of bed needs has its values, but also its liabilities. It tends to obscure the fact that any standard of bed needs, in the very nature of the case, is simply an approximation, that needs are constantly changing, and that good planning must take account of all the changing factors which affect or determine bed needs.

Definition of Need and the Factors Affecting Need

At the outset it is necessary to define what we mean by "need for general hospital beds." By this term is meant that number of beds which is required, under conditions of effective and appropriate use of hospital facilities, to provide such general hospital care to the population as is needed for adequate health care. By general hospital care is meant all hospital care for both acute and chronic illness other than that provided in hospitals specially designed for the care of mentally ill persons or those with tuberculosis. By hospitals are meant places designed for the in-patient care of the sick, excluding institutions providing primarily domiciliary or custodial care.

"Need" for service must be differentiated from "effective demand." The "need" for service is a medical concept; it is that level of service required for good health care. The "effective demand" for service is largely an economic concept; it is that amount of service which a given population is willing to buy and pay for at any given time and at given charges or costs for hospital care. The demand for service is a resultant of need influenced or modified by many other factors: the extent to which desirable services are available; the extent to which people are conscious of their need for service; their ability to pay for needed service; the methods by which people pay for service, e. g., the presence or absence of prepayment; and the extent to which arrangements exist for providing "free" care to those unable to pay

[1] For mental beds the ceiling is 5 beds per 1,000 population, and for tuberculosis beds, 2½ times the average annual number of deaths from tuberculosis in the State during the 5-year period 1940–44.

for their own care. In many communities, as we shall see, the "effective demand" for service is far less than the "need." Under some circumstances a population may demand and receive more hospital service than is needed, in that people, particularly if insured against hospital costs, may receive care for conditions which could be diagnosed and treated just as effectively in an out-patient department or the physician's office or patient's home.

It is extremely important to keep this differentiation between "need" and "effective demand" in mind. The history of discussions of the number of beds needed is marked by continual confusion between the number of beds required to provide adequate service to the population and the number of beds that a community at any given time requires in order to meet current demands for service, i. e., the number of beds that it can support under given methods of financing hospital service.

Numerous factors affect the need for hospital service and hence the need for hospital beds. Changes in medical knowledge and techniques—new diagnostic and treatment procedures, new drugs, new concepts of adequate care in particular diseases or conditions—constantly affect the volume of hospital service required for particular diseases or conditions, and hence the total volume of service required. For example, some of the new drugs introduced during the past decade have greatly reduced the number of cases of certain illnesses which require hospitalization and the length of stay of cases which are hospitalized. Within the last ten years the development of the practice of early ambulation in various conditions has resulted in a marked decrease in the average length of stay and hence in the need for hospital service. On the other hand, certain medical discoveries, by making it possible through prolonged care to save or lengthen the lives of patients who might otherwise have died soon after the onset of their illness, may have increased the need for hospital service.

The practices of physicians and the public in the use of hospitals and the character of the hospital as a medical institution all determine the need for hospital service. Only a few decades ago hospitals were largely regarded as places for the sick poor; the self-supporting citizen seldom thought of entering their doors for care. Today all this has changed. Now the hospital is the preferred workshop of the physician and usually is the real center of medical care in the community. The idea of going to the hospital, even in relatively minor illnesses, has become a part of our accepted way of life. Consider the transformation with respect to maternity care. As recently as 1935 only 37 percent of all births took place in hospitals; today over 87 percent of all births take place in hospitals.

The extent to which physicians find it convenient to hospitalize

their patients instead of making home calls greatly influences the need and demand for hospital service.[2]

The concentration of diagnostic services in hospitals may well have operated to bring into the hospital as in-patients various patients who do not absolutely require bed care and thus to increase the volume of hospital service considered to be needed. On the other hand, the further development of hospital out-patient departments, with service available for private patients, may well tend to reduce the volume of in-patient care thought to be needed. The development of programs of home care, as an extension of hospital service, appears to hold considerable promise of reducing the volume of hospital in-patient service.

An important factor in the determination of need for hospital care is the definition of hospitals and of hospital care. At present a substantial volume of bed care for sick, invalid and infirm persons is provided in institutions or places variously known as nursing, convalescent and rest homes. In general, though not always, these places are not considered to be hospitals and do not enter into the statistics of hospitals and hospital care.[3] However, the line between these institutions which certainly provide a type of medical care and hospitals is a faint one. The inclusion or exclusion of nursing homes and the type of care provided in them from the definition of hospitals and hospital care will have an important bearing upon estimates of the need for hospital care.[4]

Changes in the composition of the population likewise result in changes in the need for hospital service. Aged persons require far more hospital service on the average than do those in the younger ages. The increase in the proportion of our population in the upper age brackets has brought and will bring with it an increase in the need for hospital service.

The need for hospital service is, therefore, not something which can be measured with exactness. It is a result of the state of medical knowledge, the attitude and customs of physicians and the public,

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[2] In North and South Dakota, and in the Province of Saskatchewan to the north, the volume of hospital service received by the population is substantially higher than in other States and areas of like economic status. Apparently a prime factor in this is that these areas are so sparsely settled that physicians find it infeasible to make many home calls—they would be spending all their time on the road—and hence they recommend hospitalization in cases which elsewhere would be cared for in the home.

[3] However, one State Agency (Connecticut) administering the Hospital Survey and Construction program now denotes all nursing and convalescent homes as chronic hospitals, and includes these facilities in its count of hospitals. The Iowa, Maryland, and Washington State Agencies also include nursing homes in their count of chronic disease facilities.

[4] Webster's Dictionary defines a hospital as "an institution in which patients or injured persons are given medical or surgical care." The Model Hospital Licensing Act drawn up with the collaboration of the American Hospital Association, the American Medical Association, the American Public Health Association and similar national organizations, defines a hospital as "a place devoted primarily to the maintenance and operation of facilities for the diagnosis, treatment or care for not less than 24 hours in any week of two or more nonrelated individuals suffering from illness, disease, injury, or deformity, or a place devoted primarily to providing for not less than 24 hours in any week of obstetrical or other medical or nursing care for two or more nonrelated individuals. The term hospital includes public health centers."
Both of these definitions would seem to include nursing homes.

the whole place of the hospital in the medical scheme of things, and many other factors. Nevertheless, the need—the product of these intangibles—must be measured as best we can.

With this general introduction, we are ready to begin our analysis of the volume of hospital service required by the population and the number of beds needed to provide that service. The analysis will be in three parts: first, a review of previous estimates of the number of hospital beds needed to serve the population; second, a review of the present situation and of changes over the years in the volume of hospital service utilized by the population and in the supply of hospital beds; and third, a new estimate of the volume of hospital service needed by the population and the number of beds required to give that service.

2. Past Estimates of Hospital Beds Needed for General Care

The following discussion reviews various estimates which have been made in the past of the need for general and chronic hospital beds. In some instances it has been necessary to go into considerable detail in the description of the estimate and its basis. In considering these estimates it must, of course, be borne in mind that they relate to the then existing circumstances which included, at least in the earlier years, a somewhat higher incidence of communicable disease than at present. The arrangement is chronological, starting with a report of the American Hospital Association in 1927.

Committee on County Hospitals American Hospital Association, 1927

In a report presented by the Committee on County Hospitals at the 1927 Convention of the American Hospital Association,[1] a figure of 5.0 general hospital beds per 1,000 persons in the population was suggested as one which represented the normal requirement for general hospital services. Although the details of the method used in arriving at this estimate were not given in the report, indications are that the figure was based on the average hospital utilization rate in urban communities. The report stated that "these estimates must be regarded as suggestive only. The estimated requirement for general hospital purposes of 5 beds per 1,000 population is doubtless higher than would be needed in many communities where the people have not been encouraged to use hospital facilities or where they have not had good opportunity to do so. The precise need in any community can be determined only by first hand study of local needs, but we believe that few communities can offer adequate hospital care to all types of sick without maintaining the 5 bed per 1,000 population standard."

It is not clear whether or not the Committee considered that the bed needs for chronic or communicable disease patients were included in the above requirements for general beds. In any case it made no attempt to estimate the separate bed requirements for these patients.

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[1] *Report of the Committee on County Hospitals for 1927. Transactions of the American Hospital Association, 29th Annual Convention.* Chicago, 1927. pp. 214–216.

Duke Endowment, 1928

The Duke Endowment, in February 1928, issued a report on *The Small General Hospital.*[2] In this publication, estimated bed-population ratios were provided for urban and rural community groups "interested in the location, building, and equipment of small hospitals adapted to the needs, means, and uses of the rural sections of our country." The ratios suggested were based on studies of the authoritative literature on the subject. As the report stated, "the average number of beds per 1,000 people in our larger cities is approximately 5, and hospital authorities regard that number as a normal supply. An occupancy of 75 percent of the beds is considered a normal use. This would leave a reserve of 25 percent for expected fluctuations in the prevalence of disease.

"In addition to the normal supply of 5 general hospital beds per 1,000 population, authorities consider the need of hospital beds for special conditions to be as follows:

"For contagious diseases, .5 bed per 1,000 population.

"For diseases of children, .5 bed per 1,000 population.

"For maternity cases, .45 bed per 1,000 population.

"For tuberculosis as many beds as average annual deaths in the community over the last 5-year period."

The report stated that various sickness surveys indicated that at any one time there are usually 3.75 hospital cases for every 1,000 population (20 to 30 out of every 1,000 in the population are sick at any one time, of whom an average of 10 percent or 2 to 3 persons will constantly need hospital care, *plus* 1.25 cases per 1,000 of physical impairment requiring hospitalization). The provision of 5 hospital beds per 1,000 population provides for this number of hospital cases and supplies the surplus, 1.25 beds per 1,000, for peak loads of sickness.

With regard to rural hospital bed needs, the report stated that it is not likely that the demand for hospital beds in a rural community will be in excess of one-half of the estimated number of hospital cases (2 to 3 cases per 1,000 people).[3] The other half would continue, for a time at least, to go out of the county for hospital care. On this assumption, a ratio of 1 bed per 1,000 population in rural counties was suggested for the early years of hospital development. "Under rural

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[2] Rankin, W. S.; Hannaford, H. Eldridge; and Van Arsdall, H. P. *The Small General Hospital.* Charlotte: The Trustees of the Duke Endowment, 1928. pp. 10–12. (Bulletin No. 3).

[3] In the 1932 revision of the study, it was stated that the demand for hospital beds in rural counties would not likely be in excess of one-third of the estimated number of hospital cases, i. e., one-third of 2–3 cases per 1,000 people. The remaining two thirds would go outside of the county for hospital care. Occupancy, in this revised report, was estimated at about 60 percent, leaving a reserve of 40 percent for meeting seasonal variations in disease incidence.

conditions," the report stated, "and in the early development of hospital facilities, an occupancy of 66 percent of the beds is perhaps all that should be expected."

Dr. Haven Emerson, 1930

Dr. Haven Emerson, in 1930, proposed a set of standards for the provision of adequate hospital care of the sick in urban communities of 50,000 or over.[4] Emerson based his standards on an average hospital stay of 14 days per patient, with 80 percent occupancy of hospital beds. The estimates so derived were as follows:

Type of Patient	Estimated hospital bed needs for a city of 100,000	
	Number	Per 1,000
General medical, surgical, children, and maternity patients	500	5.0
Children	50	------
Maternity	44	------
Communicable diseases	50	.5
Chronic sick	200	2.0
Convalescent patients	75	.75
Total	825	8.25

In his discussion of these standards, Dr. Emerson stated that "while the use of general hospital beds in large industrial communities in the United States varies apparently according to local demand and need from 3 per 1,000 of the population to as much as 9, the provision of 5 beds per 1,000 will rarely need to be exceeded. In small towns and many rural areas not affected by serious occupational hazards or the illnesses that accompany congested housing in cities, as low a ratio as 2 beds per 1,000 appears to satisfy the demand.

"Of these beds 1/10 should be available for children other than the newborn. For maternity patients the number of beds depends upon two major factors, the birth rate in the community and the custom of the people with regard to home or institutional care of confinements. If experience shows that 50 percent of the births of a community generally occur in hospitals and the annual birth rate is 18 per 1,000 of the population, 44 beds for maternity patients would be needed for a population of 100,000. . . .

[4] Emerson, Haven, M. D. Estimating Adequate Provision for Organized Care of the Sick. *The Modern Hospital*, Vol. 35, No. 3 (Sept. 1930), pp. 49–51.

"Increase of hospital accommodations should in general be undertaken by any community only after it has studied the demand as well as the need for hospitalizing the sick in its particular population group.

"For acute communicable diseases additional hospital provision should be made up to 1 bed for each 2,000 of the population, the variables in this field being the attitude of the health officer toward hospitalization and the degree of room or home crowding that prevails in the families with children under school age. If these beds are provided under the management of a general hospital in an attached pavilion or ward equipped for cubicle care and are made convenient for the practice of aseptic medical technique, probably during 6 months of the year they can safely be used for other than reportable communicable diseases, especially in children."

With regard to care for the chronic sick, Dr. Emerson estimated that at least 2 beds are needed for each 1,000 of the population. He pointed out that surveys of the chronic sick have revealed not less than 1 such patient for each 200 of the population. In other words, in a theoretical city of 100,000 persons, 500 chronic sick persons would be found, some of whom would be cared for at home but at least 200 of whom would at all times need hospital care.

Committee on the Costs of Medical Care (Lee–Jones), 1933

In 1933, the Committee on the Costs of Medical Care released a report [5] which, to the present time, has been widely used as an estimate of the medical needs of the population. One purpose of the report, *The Fundamentals of Good Medical Care*, by Dr. Roger I. Lee and Lewis Webster Jones, was "to estimate the amount and kinds of service and the personnel and facilities required to supply the medical needs of the people of the United States." On the basis of the annual expectancy rates of the diseases and conditions for which medical care is required, and the application to these rates of quantitative estimates of procedures involved in good medical practice, Lee and Jones produced estimates of the volume of medical and hospital services required for adequate care of the population and the numbers of medical personnel and facilities required to provide this volume of service.

Annual disease expectancy rates used in this study represented "an adaptation for purposes of this study of available and relevant

[5] Lee, Roger I., and Jones, Lewis Webster. *The Fundamentals of Good Medical Care.* (Committee on the Costs of Medical Care Publication No. 22.) Chicago: The University of Chicago Press, 1933.

data, considered to be trustworthy, on the prevalence and incidence of conditions requiring diagnosis and treatment." Among the sources for these data were the Hagerstown Morbidity Study, special studies of college students, studies of medical officers' families and industrial workers, and the national family study by the Committee on the Costs of Medical Care.

The fundamental procedures necessary for good medical care, and the quantitative estimates of the services required for the diagnosis and treatment of diseases and physical and mental defects, were developed from opinions and records of more than 125 practicing physicians. These physicians were asked to give their opinions or, if possible, the records of their practice to indicate the amount of service necessary in each broad disease category—for example, digestive or respiratory diseases. "For each of the representative diseases within the category (e. g., appendicitis or influenza) similar data were requested concerning the amount of service of various kinds required in the treatment of 100 typical cases, with such considerations as the average duration of the disease and the normal proportion of severe to mild cases. The physicians' replies were made the basis of arbitrary estimates of the services required." [6]

In general, the services were measured in units such as physician-hours, nursing days, and hospital days. For general hospital care, therefore, the diagnostic and therapeutic services needed for the treatment of diseases and defects and for the puerperal state were translated into days of hospital care required. The needed hospital days were then converted into hospital beds by assuming an average occupancy rate of 80 percent (or 300 days' occupancy per year). By this method, the following number of general hospital beds required to serve a population group of 100,000 was derived:

	Hospital days needed per 100,000 population	Hospital beds needed per 1,000 population
Total	138,474	4.62
Maternity	20,379	.68
Medical ward	62,893	2.10
Surgical ward	51,398	1.71
Psychiatric ward	3,804	.13

These estimates did not include the service required in convalescent homes or for care of the chronically ill persons who did not require hospital care for medical reasons but could not be cared for

[6] *Ibid.*, p. 102.

at home because of poor home conditions. With regard to communicable disease care, approximately 1 bed per 1,000 population was included in the total of 4.62. (According to a report by Michael M. Davis,[7] this allows for the hospitalization of a much larger proportion of communicable disease cases than is normally hospitalized in general hospitals. Davis suggested reducing the Lee-Jones figure to about 4.0 beds per 1,000 with occupancy running at about 80 percent.)

Alden and Patsy Mills, 1935

In 1935, a study of the need for general hospitals in rural areas was made by Alden and Patsy Mills.[8] As a first step in the study, a systematic analysis was made of all local or community hospitals for acute conditions, excluding hospitals for nervous and mental, tuberculous, chronic, and convalescent patients. Hospital service centers (areas within a 50-mile radius of cities containing more than 250 hospital beds) were then indicated on county maps. Counties not so served were divided "into reasonably compact and homogeneous hospital areas." To determine the number of additional beds needed in poorly supplied rural areas, a ratio of 2 beds per 1,000 persons was adopted as a minimum. This was selected as a conservative "halfway" figure between a ratio of 1 bed per 1,000 as recommended by the Duke Endowment as an initial "standard"—with more when people became accustomed to using hospitals—and a ratio of 3 beds per 1,000 for other than metropolitan areas after correcting for care of rural patients who came into the city for hospital care. The Mills pointed out that the experience in Saskatchewan, where rural hospital service was being provided through cooperation of provincial and municipal authorities, indicated a ratio of 3 to 4 beds per 1,000.

In the study, the Mills warned that, before actually locating a hospital, consideration must be given to factors which affect scientific as well as economic questions, such as: size of population; size of area to be served; density of population; number and training of physicians in the area; extent to which the provision of hospital facilities would improve conditions of medical practice through assisting present practitioners or attracting new ones; distance to other hospitals; road conditions, summer and winter; the health knowledge of the people and the extent to which they could be educated to use hospitals when necessary; the suitability of home conditions for caring for less serious illnesses; financial resources of the population, that is, occupational and income groupings, and the extent to which new

[7] Davis, Michael M. Are There Enough Beds? Or Too Many? *The Modern Hospital*, Vol. 48, No. 5 (May 1937), pp. 49–52.
[8] Mills, Alden B., and Mills, Patsy. The Need for More Hospitals in Rural Areas. *The Modern Hospital*, Vol. 44, No. 3 (March 1935), pp. 50–54.

methods of paying for medical service may be devised which will facilitate support of rural hospitals.

Committee on Hospital Planning, A. H. A., 1935

A 1935 report of the American Hospital Association's Committee on Hospital Planning and Equipment[9] contained some interesting comments and proposals concerning general hospital bed requirements. According to this report, "For many years bed quotas have been adopted on the basis of two generally accepted formulae established by Public Health authorities,

"First: that from 2 percent to 3 percent of the population are at all times incapacitated by accident and illness, of whom about 10 percent require hospitalization in acute beds.

"Second: that in urban communities 5 acute beds per 1,000 population and in rural districts from 1 to 3 beds are necessary for the adequate care of medical and surgical conditions and childbirth.

"The present situation in the hospital field indicates that both the formulae themselves and the way they have been used are in need of revision. It is quite obvious that conditions vary too widely in each district and in different sections of the country to make uniform yardsticks of general practical application. Yet it is probable that much of our overbuilding is due to their ill-considered use.

"For a community of 100,000—the first formula would forecast 250 patients a day while the second would provide two acute beds for each patient."

The report went on to state that, in the near future, a falling birth rate and the extension of good maternity home nursing would probably change the trend of increasing demand for maternity beds—thereby reducing the number of acute beds reserved in hospitals for this purpose. In addition, the report stated, consideration would have to be given to the steady decline in the average stay of the general hospital patient and to the influence of preventive medicine in keeping people well.

"To intelligently determine how many beds a given community needs," the report stated, "requires that many conditions be analyzed far in advance of the first architectural sketch. There are involved considerations of the size, racial groups and rate of growth of the population, its economic status and intelligence, the character of its housing and industries, its transient visitors and dependent districts, its present hospital facilities and to what extent they are used, its morbidity levels and the number and caliber of its medical profession."

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[9] Report of the Committee on Hospital Planning and Equipment. *Transactions of the American Hospital Association, 37th Annual Convention.* Chicago, 1935. pp. 740–752.

In the light of conditions found throughout the country with regard to utilization of hospital beds, the Committee made the following recommendations for *acute* beds per 1,000 of the population:

1. For large metropolitan centers having general multiple housing, extensive suburbs and nationwide medical prestige—5 beds per 1,000 of the city's census.

2. For cities which serve as medical centers for extensive districts and suburbs not adequately self-hospitalized—4 to 5 beds per 1,000.

3. For smaller cities—3 to 4 beds per 1,000.

4. For rural districts—up to 1 bed per 1,000.

The report emphasized that these ratios should be used only to suggest and not determine bed quotas and offered "the thought that it is far more economical for a hospital to be overcrowded for a relatively few days each year than to be overbedded every day."

No estimate of the need for chronic disease beds was presented by the Committee.

Technical Committee on Medical Care, 1938

In 1938, the Technical Committee on Medical Care of the Interdepartmental Committee to Coordinate Health and Welfare Activities (of the Federal Government) reported that "professional standards of adequacy indicate a need for general hospital facilities in the ratio of 4.6 beds per 1,000 persons."[10] The method of arriving at this estimate was not described in the Committee's report, but it is understood that the standard used was that developed by Dr. Roger I. Lee and Lewis Webster Jones. (See p. 9.)

Dr. T. R. Ponton, 1943

Dr. T. R. Ponton, former editor of *Hospital Management*, in 1943 summarized the results of 6 years of study of hospital needs in his article "Survey Reveals Need for Increased General Hospital Service in U. S."[11] The objective of the study was "to determine the volume of *general* hospital service available, its quality, and the degree to which hospitals are accessible to the people they should be expected to serve."

"The only practical basis of estimating the need is to arrive at a fixed ratio to population," Dr. Ponton stated, "but unfortunately there is no accurate means of determining this ratio. It is a very variable factor. . . . The most logical method of estimating the ratio appears to be the application of the law of supply and demand—to use a ratio determined by the present use of hospital facilities."

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[10] [illegible]e to Coordinate Health and Welfare Activities. Technical [illegible] *the Need for a National Health Program.* Washington: [illegible] 6, 1938. p. 32.

[11] [illegible]rey Reveals Need for Increased General Hospital Service [illegible] Vol. 56, No. 2 (August 1943), pp. 17–19, 38, 40.

A ratio of 2.5 *general* beds per 1,000 population based on hospital use and used by Dr. Ponton for many years had, he stated, given satisfactory results. Moreover, it compared favorably in his opinion with the ratio used by the Interdepartmental Committee to Coordinate Health and Welfare Activities in 1938. Although the ratio used by the Committee was 4.6 beds per 1,000 population, this, as Dr. Ponton stated, applied to general beds plus all special beds except those for tuberculosis and mental disease. If special beds were excluded the ratio would be approximately half, or near the 2.5 figure used by Dr. Ponton.

Mountin, Pennell and Hoge, U. S. Public Health Service, 1945

The Public Health Service in 1945 developed a ratio of 4.5 beds per 1,000 population for use in a study of non-Federal general hospital requirements in health service areas. In the report on this study [12] it was stated that the 4.5 figure "admittedly is a compromise between a theoretical ideal and a practical achievement."

Before determining upon this ratio, careful study was made of the "standards" which had been developed earlier by other authorities in the hospital care field. The results of the study indicated that 4.5 beds per 1,000 population represented a reasonable standard of adequacy, provided that certain assumptions were made:

(1) That these beds would accommodate all persons requiring hospitalization *except those with tuberculosis or mental disorders;*

(2) That the factors which tend to limit the amount of hospitalization, such as distance, insufficient accommodations, inability to pay for service, and unwillingness to enter hospitals, would be removed or reduced to a minimum;

(3) That beds would be utilized at not less than 80 percent of capacity.

While the 4.5 ratio was below that proposed by some authorities as theoretically desirable, it was somewhat above the existing ratio in a group of States which might be considered relatively "well-favored" economically. The authors of the report felt justified in using a ratio below a theoretical ideal for two main reasons: "First, a coordinated scheme of operation in any program of hospital development should even out wide variations in use of existing hospitals; and second, it would seem that by first bringing up ratios of beds available for all areas to a reasonable standard, possible excess construction in favored communities may be averted."

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[12] Mountin, Joseph W.; Pennell, Elliott H.; and Hoge, Vane M. *Health Service Areas: Requirements for General Hospitals and Health Centers,* (Public Health Service Bulletin No. 292). Washington: U. S. Government Printing Office, 1945. pp. 4–7.

In the Public Health Service study, hospital service regions and districts within regions were outlined for each State. As a first step, all cities and villages containing hospitals and the number of beds in general and special hospitals were located on large-scale State maps. Acceptance of hospitals for nurse, intern, or resident training, or approval by the American College of Surgeons was indicated. As a second step, certain cities and towns were designated as possible centers for local districts. "According to standards adopted for purposes of the study, cities containing 250 or more general hospital beds some of which are located in a hospital approved by the American College of Surgeons were considered qualified to be selected as primary centers. Cities or towns with from 100 to 249 beds were designated as possible secondary centers. Because many areas are somewhat removed from any such primary or secondary centers within the same State, other places containing at least 50 beds were suggested as eligible proposed-secondary centers on the assumption that the facilities might be increased and upgraded later to meet the criteria for secondary centers. . . . After hospital accommodations had been reviewed, counties were classified as possible nucleuses for primary, secondary, or proposed-secondary districts according to the types of centers which they contained." Following this classification of counties into the various types of districts, it was found that some counties remained which neither contained communities with as many as 50 beds nor were adjacent to other counties with such facilities. Counties of this kind were either attached to the most accessible local districts or, if contiguous, were grouped into an isolated district.

"When local districts had been tentatively charted, broad regions, each consisting of a primary district, and usually one or more secondary, proposed-secondary, or isolated districts, were outlined. The number of regions was limited by the number of cities or towns qualified to serve as primary centers, except that at least one region was set up in each State."

In determining the hospital bed need in the various States, it was recognized that, by concentrating specialized facilities and professional skills in medical centers, better medical service can be provided. It was further recognized that primary centers are required to treat, not only their own populations, but also some patients with unusual conditions referred from surrounding areas. For the study's purpose, therefore, "according to the formula used . . ., primary districts would have in addition to their basic 4.5 beds, 0.5 of a bed for each 1,000 persons residing in other districts of the same broad region. . . . In each secondary or proposed-secondary district, the estimated number of beds needed is again based upon a standard of

4.5 beds per 1,000 population, but of this total it is assumed that 0.5 per 1,000 will be located in the primary center. Thus, 4.0 beds are assured for the care of resident population not requiring the unusual skills represented in the primary center. On the other hand, secondary as well as primary hospital centers will attract patients from the outlying areas. For this reason, 1.5 beds per 1,000 based upon the population of isolated districts has been allotted to, and divided equally among, the centers of adjacent higher ranking districts. The resulting accretions of beds usually do not materially increase the ratios in districts where they are added, because, as a rule, the number of persons residing in isolated areas is small in comparison with the population in districts of other types. Isolated districts are thus left with 2.5 beds per 1,000 population for services within the skills generally provided by the medical profession. As already indicated, 2.0 beds for each 1,000 residents of these districts have been allotted to the primary and secondary centers which serve the remote areas in question."

Bed-Death Ratio, Commission on Hospital Care, 1947

The Commission on Hospital Care in its report *Hospital Care in the United States*,[18] published in 1947, suggested the bed-death ratio as a basis for determining hospital bed needs. "Sickness," according to this report, "is correlated with mortality. Most deaths are preceded by a certain amount of sickness; and each disease has an effect on mortality rates and life expectancy. Therefore, the number of deaths in an area may be used as an indication of the amount of hospital care required. This correlation, however, must be considered in broad and general terms. It becomes less definite when applied to shorter periods of time and to smaller areas. . . .

"An important aspect of the relationship between mortality and sickness is the age distribution of the population, which is very highly correlated with the crude death rate and presumably also with the sickness rate. Since the age distribution differs greatly from region to region, the death rate and probably the amount of sickness also varies from region to region. The death rate may be taken, therefore, as a factor which measures two sources of variation in sickness: (1) that due to health conditions and (2) that due to the age distribution."

From available data on hospital deaths and patient days of hospital care, the Commission found that about 250 days of general hospital care are used by the population "for each death occurring and correlated sickness cared for in a general hospital." From this, a bed-death

[18] Commission on Hospital Care. *Hospital Care in the United States.* New York: The Commonwealth Fund, 1947. pp. 289–301.

ratio of about 0.7 was derived (250 days÷365 days in year=0.685 occupied beds per day). In other words, for each hospital death, 0.7 bed is used for 1 year. According to the Commission's report, "The practical value of this ratio is in using it as a prediction factor—for estimating how many additional hospital beds would be needed if additional deaths (and correlated sickness) were hospitalized. The validity of using the bed-death ratio as an estimating factor lies in the fact that the ratio varies little from State to State. . . . The bed-death ratio is about the same in low-income States as it is in high-income States. . . . There are, of course, some variations in ratios among the States and smaller areas." Variations in the bed-death ratio in some States and communities are due to: (1) errors in the data from which ratios are calculated; (2) differences in local conditions; (3) random chance factors not particularly related to the problem. The first and third causes can probably be eliminated by obtaining more accurate basic data and by using larger samples of homogeneous data. The second cause "indicates that some States and probably many communities will have their own distinctive bed-death ratios."

To determine the number of occupied beds needed, the bed-death ratio is multiplied by the number of deaths expected to be hospitalized. On the basis of hospitalized deaths in the various States, an "average level of hospitalization whereby at least 50 percent of all deaths would occur in general hospitals" appeared to be a reasonable expectancy for the Nation. (It was assumed that, in addition, some 8 to 10 percent of deaths would occur in other types of institutions.) With an average death rate of 10.6 per 1,000 population for the years 1939 to 1943, the number of needed occupied beds would be 3.71 per 1,000 (50 percent of 10.6=5.3; 0.7 [bed-death ratio] times 5.3=3.71). Since average occupancy of general and special hospitals was 74.8 percent in 1944, total beds needed at that time would be 4.96 per 1,000 persons (3.71÷74.8×100).

The number of beds needed in each State could be determined by following the above procedure. The Commission warned, however, that "in some States the percentage of deaths occurring in hospitals is much less than in other States. Such States, no doubt, will require a longer time to attain the suggested national average. It might be well, therefore, to set a different goal for each State, a goal that could be reached within a period of 10 or 15 years. Then, as the building program progresses, new and higher goals might be set from time to time as the situation might indicate."

The Commission further suggested that inclusion of a bed-birth factor in the formula seems logical since an estimate of needed hospital beds should be based on births as well as deaths. However, since the newborn death rate does not differ markedly from the adult hos-

pital death rate in most States, the use of the bed-birth factor would be most advantageous in those areas with high birth rates and low infant mortality rates.

The method suggested by the Commission for including the bed-birth factor in the formula is as follows:

"If the average length of stay per maternity case is assumed to be 11 days, each obstetrical patient would require a bed for 0.03 of a year. This is the bed-birth ratio. It would vary proportionately with any different length of stay. When the bed-birth ratio is used, the bed-death ratio must be decreased by an amount which reflects the proportion of all hospital beds likely to be used for the obstetrical service. At present, about one-seventh of all hospital beds are used for obstetrical care. Therefore, the bed-death ratio for general illnesses should be only 0.6 (less if the birth rate should drop, and more if it should rise). The bed-death and bed-birth ratios should be applied to the deaths and births which are expected or planned to occur in hospitals. . . .

"If it is asumed that 50 percent of all deaths and 100 percent of all births should occur in hospitals, the formula for estimating the number of occupied beds needed may be stated as follows:

"Occupied beds needed equals 0.6 times 50 percent of the deaths plus 0.03 times the births."

The Commission emphasized that the bed-death formula, which is unique since it is based entirely on need and on vital statistics rather than general population, does not reduce the problem of estimating needs to a simple mechanical process but should be used with good judgment. It should be considered a first approximation to determining need, with due consideration to many local factors.

Hospital Survey and Construction Act and Program

As mentioned above the Hospital Survey and Construction Act set forth certain ceilings on the number of beds beyond which Federal aid for construction would not be available. These, to repeat, were 4.5–5.5 general beds per 1,000 population depending upon State population density, and 2.0 chronic disease beds per 1,000 population.[14]

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[14] The basis for the ceiling of 2 beds per 1,000 for chronic disease is not as firm as that for acute beds. In testifying before the Senate Committee on Education and Labor on S. 191 (the Bill which later became the Hospital Survey and Construction Act), the then Surgeon General of the U. S. Public Health Service, in describing the general magnitude of the hospital construction problem and the need of the country for additional beds, confined his remarks solely to the needs for general, tuberculosis and mental hospital beds and health centers and made no reference to any need for chronic disease beds. Subsequently in submitting an explanation of a proposed formula for allotment of Federal funds among the States, under which allotments would be based partly on the bed deficits (need) of each State, a statement was made as to the method and basis of estimating the need for general, mental, and tuberculosis beds, but as regards chronic disease hospital beds no estimate of a deficit was given, and it was stated that "No attempt was made to estimate any deficits in this category since the measure of need for chronic disease hospital beds has not yet been established." (Senate Committee Hearings on S. 191. 79th Cong., 1st sess., 1945, p. 95.)

As originally introduced in the Senate, S. 191 did not carry the present bed ratios fixing the limits beyond which Federal aid would not be provided. These ratios were included

Regulations, prescribed by the Surgeon General in accordance with a provision of the act, require each State participating in the program to develop a coordinated plan for the general (acute) hospitals in the State. Under this plan, the State would have one or more hospital service regions with each such region subdivided into base, intermediate, and rural service areas. The basic concept of the plan is that the base hospital or hospitals, which would have complete facilities for diagnosis and treatment, would aid hospitals in the intermediate and rural areas in providing certain services which could not be provided by the smaller hospitals individually.

The regulations instruct the States to take as the standard of need the ceilings for Federal participation set forth in the act. In addition the regulations provide additional "standards" for determining general hospital beds needed in base, intermediate and rural areas. These bed-population ratios are based on the assumption that a certain proportion of the population in rural areas will go to intermediate and base areas for hospital care and that a certain proportion of the population in intermediate areas will be hospitalized in the base area rather than in their own areas. The standards thus arrived at and prescribed in the regulations were as follows:

Type of area	Minimum standards of general hospital beds per 1,000 population in States with specified number of persons per square mile		
	12.0 or more persons	6.1–11.9 persons	6.0 and less persons
Base	4.5	5.0	5.5
Intermediate	4.0	4.5	5.0
Rural	2.5	3.0	3.5

The difference between the number of beds planned for under the area ratios and the total number of beds estimated to be needed under the State ratio constituted a State "pool" of beds which could be allotted by the State agency among the different areas as it saw fit.

The standards of bed needs set forth in the act and the regulations have greatly influenced hospital planning. These standards or esti-

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in the draft of the bill reported out by the Committee. It is understood that the standard for chronic disease beds (2 per 1,000 population) was suggested informally to the Committee by members of the staff of the Public Health Service, and that the estimate was based on data from the National Health Survey (1935–36) which showed that at the time of the survey 11.7 persons per 1,000 population had been disabled for the entire 12 months or more immediately preceding the survey visit. Of these 2.16 suffered from nervous and mental disease and 0.61 from tuberculosis, and some of these were in institutions. Of those disabled by general illness it was estimated that approximately 20 percent would require long term institutional care.

In reporting out S. 191 the Senate Committee made the following statement relative to chronic disease hospitals: "None of the witnesses appearing before your committee was able to offer any estimate of the total need for chronic disease beds. It was apparent, however, that these facilities are grossly deficient throughout the country. The Committee decided to provide for aid up to 2 beds per 1,000 persons for chronic illness." (*Report of the Senate Committee on Education and Labor on S. 191.* October 30, 1945, 79th Cong., 1st sess.)

mates represented the consensus among hospital authorities at th time of their adoption, and hence should occupy a prominent plac in this review of past estimates of bed needs.

Summary—Past Estimates

The foregoing are the principal estimates which have been mad in this country over the last 25 years or so as to the number of genera hospital beds required for care of the population. The difference among the estimates emphasize the statements of the estimators to th effect that no precise figure can be adduced to measure for once an all the need of the population for hospital service. Various factor influence the need for hospital service. Consequently a growing o lessening importance of one or more of the factors will have a sig nificant effect upon the population's need for hospital beds.

The various estimates also reflect the rather unsatisfactory stat of our knowledge with respect to chronic illness, its relation to acut illness and the volume of care required for it. A good many of th estimates provide no separate estimate of the need for beds for chroni illness and apparently consider that the single figure put forward fo general hospital beds covers the need for all beds other than those i tuberculosis and mental hospitals. It is of some interest, also, tha whereas some of the early estimates provide separate estimates of th need for communicable disease beds, apparently on the assumptio that these beds would be located in separate communicable disease hospitals, later estimates include no such separate figure, thus reflect ing the thought that separate facilities for these types of cases ar not required—that these cases can be cared for most advantageously in the general hospital. Perhaps ultimately the same conclusion wil be reached concerning chronic illness.

3. Existing Beds and Volume of Service

In 1951 there were in the continental United States 713,422 general hospital beds, i. e., beds in hospitals other than hospitals for tuberculosis and mental disease.[1] This is inclusive of beds in Federal hospitals and in hospital departments of institutions. This number of beds is equal to 4.7 per 1,000 population. In the same year the admissions to general hospitals amounted to 116.2 per 1,000 population and the number of days of service to 1,243.5 per 1,000 population, a little more than 1 day per capita.

The trend since 1927 in the number of general hospitals and in admissions and patient days of service in relation to the population is shown in table 1 and charts 1–4.

From 1927—which is the earliest year for which these figures are available—the number of beds per 1,000 population increased slowly but steadily (except for a slight decline in 1933), from 3.5 beds per 1,000 population in 1927 to 4.0 beds in 1940. During the same period there was a substantial increase in the number of admissions, a slight decline in the average length of stay and a substantial increase in the volume of service—from 832 days to 1,019 days per 1,000 population. With the war, there was a tremendous expansion in the number of hospital beds and the volume of hospital service. Almost all of this expansion was in military hospitals or in hospitals for veterans. The rate of hospitalization for men in the military service tends to be exceedingly high even apart from military casualties, owing to the fact that men unfit for duty are hospitalized and are not discharged until fully able to return to active duty. Right after the end of the war, in 1946 and 1947, there was a marked decline in the number of beds and volume of service, as military hospitals were closed and men in uniform demobilized.

During the years 1948, 1949, and 1950, the number of beds leveled out at about 10 percent higher than in 1940. In 1951 the number of beds increased again, due largely to the increase in beds in military hospitals. The number of admissions in relation to the population has apparently resumed the upward trend which characterized it before the war, the average length of stay per case is appreciably lower, and the overall volume of service is about 22 percent higher than prewar.

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[1] *Hospital Service in the United States: The 1951 Census of Hospitals.* Reprinted from the *Journal of the American Medical Association*, May 10, 1952. The figure quoted represents the total of all beds in hospitals, exclusive of "nervous and mental" and "tuberculosis" hospitals, which are registered by the American Medical Association. Appendix A presents a tabulation by State of the number of "general" and "chronic" beds in non-Federal hospitals as shown by the plans submitted by the States under the Hospital Survey and Construction program.

TABLE 1.—General Hospital Beds, Admissions and Days of Service Per 1,000 Population and Average Length of Stay, 1927–1951 [1]

Year	Beds per 1,000 population [2]	Admissions per 1,000 population [2]	Days of service per 1,000 population [2]	Average length of stay (days)
1927	3.5	([3])	832.1	([3])
1928	3.6	([3])	([3])	([3])
1929	3.5	([3])	841.2	([3])
1930	3.7	([3])	865.9	([3])
1931	3.7	57.0	859.8	15.1
1932	3.7	55.8	858.0	15.4
1933	3.6	54.0	799.8	14.8
1934	3.7	54.5	814.3	14.9
1935	3.7	58.6	882.0	15.0
1936	3.7	65.3	912.9	14.0
1937	3.7	69.3	942.7	13.6
1938	3.8	70.3	947.8	13.5
1939	3.9	73.3	986.9	13.5
1940	4.0	74.3	1,019.2	13.7
1941	4.5	84.8	1,133.7	13.4
1942	4.9	91.4	1,217.6	13.3
1943	6.9	112.5	1,559.5	13.9
1944	7.6	118.6	1,700.4	14.3
1945	7.6	120.6	1,993.7	16.5
1946	5.1	105.7	1,413.4	13.4
1947	4.6	107.6	1,280.4	11.9
1948	4.4	109.6	1,214.7	11.1
1949	4.4	107.0	1,179.0	11.0
1950	4.4	109.8	1,165.3	10.6
1951	4.7	116.2	1,243.5	10.7

[1] All hospitals exclusive of nervous and mental and tuberculosis facilities; includes Federal hospitals; also includes hospital departments of institutions.
[2] Based on Bureau of the Census estimates of total population excluding armed forces overseas.
[3] Data not available

SOURCE: Computed from data in annual Hospital Numbers of the *Journal of the American Medical Association*.

Over the entire 25-year span, the data show a marked increase in the frequency with which the population enters hospitals, a substantial increase in the volume of service received, and a sharp decline in the average length of stay per case.

Table 2 shows the trend of beds, admissions, and days of service per 1,000 population in general hospitals, exclusive of all Federal hospitals, for the years 1944–1951—the only years for which these data are available. The exclusion of Federal hospitals eliminates fluctuations due to the tremendous increase in military hospitalization during the war, and the post-war increase in Veterans facilities. It will be seen that the number of non-Federal beds in relation to population has remained virtually stationary over this period, the admission

rate has increased by close to 25 percent, the average length of stay has decreased in about the same ratio, and the number of days of service per 1,000 population has remained virtually level.

TABLE 2.—Non-Federal General Hospital Beds, Admissions and Days of Service per 1,000 Population and Average Length of Stay, 1944–1951[1]

Year	Beds per 1,000 population	Admissions per 1,000 population	Days of service per 1,000 population	Average length of stay (days)
1944	3.8	86.7	991.5	11.4
1945	3.9	90.4	1,059.4	11.7
1946	3.7	92.2	1,009.5	10.9
1947	3.7	99.2	1,030.0	10.4
1948	3.7	102.0	1,004.3	9.8
1949	3.6	101.8	990.0	9.7
1950	3.6	102.8	980.8	9.5
1951	3.7	106.9	1,006.8	9.4

[1] See Table 1. Data are for all hospitals exclusive of nervous and mental, tuberculosis, and Federal general hospitals.

SOURCE: Computed from data in annual Hospital Numbers of the *Journal of the American Medical Association*.

There are important differences among the States in the number of beds and volume of hospital service in relation to population. This is shown, as of 1951, in tables 3 and 4. (Table 3 shows total beds and volume of service in relation to total population and table 4 civilian hospital beds and volume of service in relation to civilian, i. e., non-military population.)[2] The number of civilian beds per 1,000 population varied from a low of 2.4 in Alabama to a high of 6.4 in Montana (excluding the District of Columbia where hospitals serve large populations residing in adjacent States). The rate of admissions per 1,000 population varied from 82 in Alabama to 170 in Montana (again excluding the District of Columbia), and the volume of service from 563 days per 1,000 population in Alabama to 1,662 in Delaware. The average length of stay varied from 6.6 to 14.6 days.

Several facts stand out in an analysis of these figures. In the first place there is a relationship between the number of beds and volume of service and per capita income. The volume of service, in general, is appreciably higher in the States of relatively high per

[2] In 1951 there were nearly 78,000 beds in military hospitals. The presence in some States of one or more large military hospitals tends to distort the figures of these States. Colorado is a prime example of this. However in considering table 4, showing civilian hospital beds and volume of service, it should be borne in mind that this table tends to understate slightly the volume of service received by the civilian population inasmuch as dependents of military personnel are served to some extent in military hospitals.

Chart 1

GENERAL HOSPITAL BEDS

Per 1,000 Population, 1927-1951

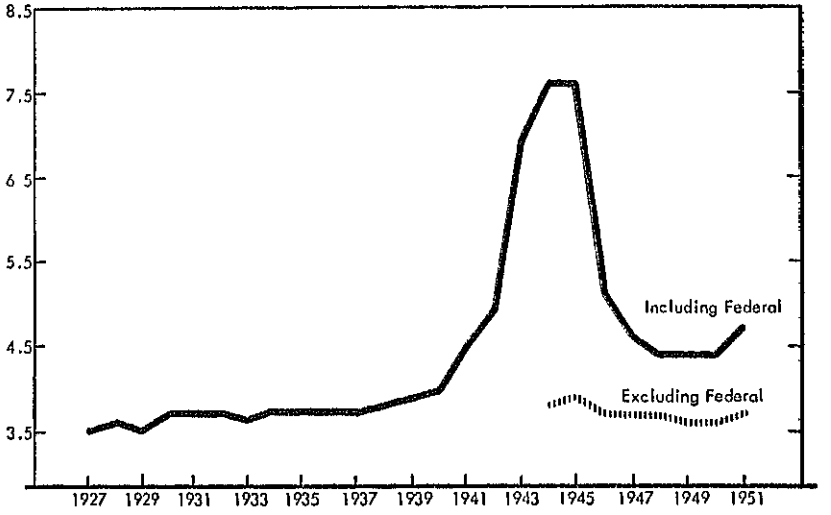


Chart 2.

GENERAL HOSPITAL ADMISSIONS

Per 1,000 Population, 1931-1951

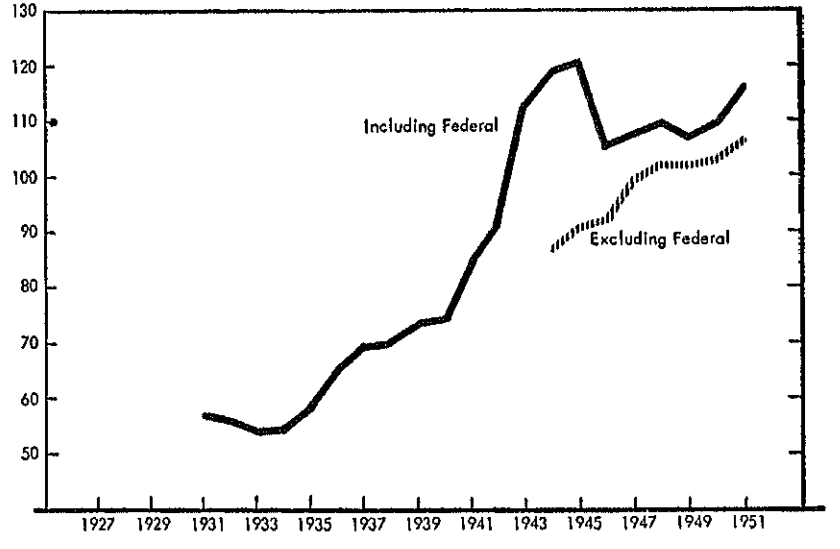


Chart 3.

GENERAL HOSPITAL DAYS OF SERVICE

Per 1,000 Population, 1927–1951

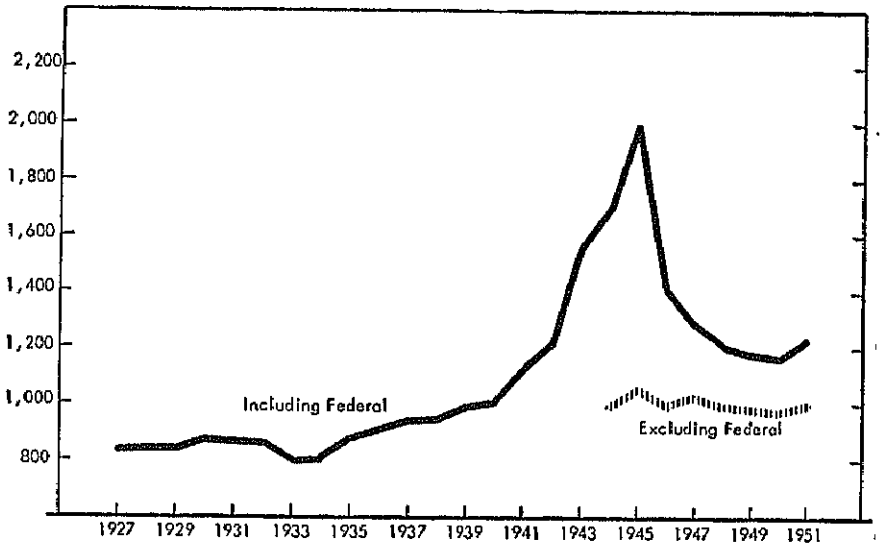


Chart 4.

AVERAGE LENGTH OF STAY IN GENERAL HOSPITALS

1931 - 1951

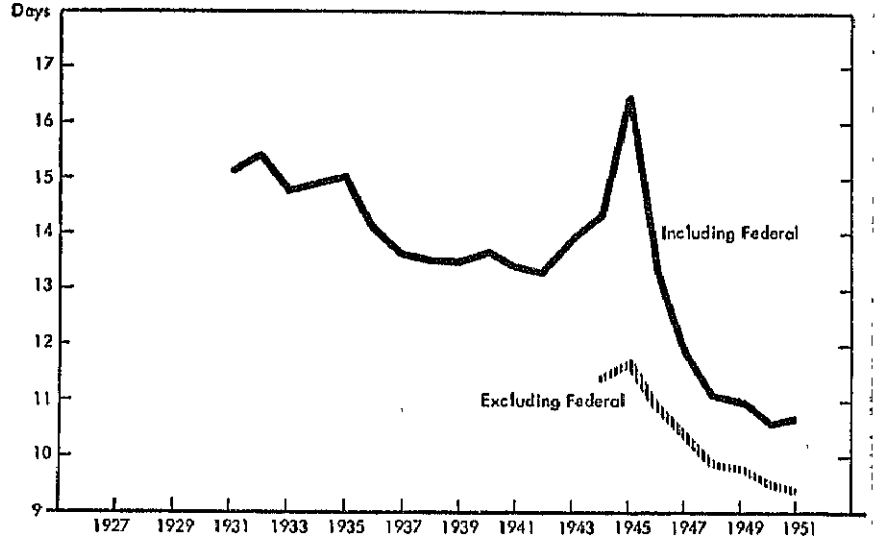


TABLE 3.—General Hospital Beds, Admissions and Days of Service Per 1,000 Population and Average Length of Stay by Region and State, 1951 [1]

Region and State	Beds per 1,000 population	Admissions per 1,000 population	Days of service per 1,000 population	Average length of stay (days)
United States	4.7	116.2	1,243.5	10.7
New England	5.3	119.6	1,396.3	11.7
Maine	3.4	98.6	884.7	9.0
New Hampshire	5.2	136.9	1,168.8	8.5
Vermont	4.7	135.7	1,214.4	9.0
Massachusetts	6.0	122.4	1,599.3	13.1
Rhode Island	5.8	99.6	1,567.2	15.7
Connecticut	4.5	122.7	1,164.3	9.5
Middle Atlantic	5.3	113.9	1,487.9	13.1
New York	5.9	121.1	1,685.2	13.9
New Jersey	4.4	99.9	1,197.4	12.0
Pennsylvania	4.8	110.1	1,343.9	12.2
East North Central	4.2	116.3	1,188.9	10.2
Ohio	3.6	107.3	1,028.3	9.6
Indiana	3.5	103.7	975.8	9.4
Illinois	5.0	123.6	1,398.5	11.3
Michigan	4.2	116.1	1,201.5	10.3
Wisconsin	4.7	133.5	1,253.3	9.4
West North Central	4.8	125.2	1,274.3	10.2
Minnesota	5.2	143.8	1,404.3	9.8
Iowa	3.6	113.1	975.4	8.6
Missouri	4.9	105.3	1,377.1	13.1
North Dakota	5.1	152.1	1,169.2	7.7
South Dakota	5.4	156.7	1,324.0	8.4
Nebraska	5.1	134.1	1,192.7	8.9
Kansas	5.1	129.2	1,336.3	10.3
South Atlantic	4.4	113.1	1,124.6	9.9
Delaware	6.0	123.8	1,641.9	13.3
Maryland	5.6	103.4	1,442.3	13.9
District of Columbia	10.3	204.0	3,296.3	16.2
Virginia	4.8	114.2	1,203.6	10.5
West Virginia	3.8	119.3	1,088.6	9.1
North Carolina	3.6	112.3	865.1	7.7
South Carolina	3.7	100.8	931.4	9.2
Georgia	3.5	105.7	805.4	7.6
Florida	4.3	108.1	1,021.0	9.4

See footnote at end of table.

TABLE 3.—General Hospital Beds, Admissions and Days of Service Per 1,000 Population and Average Length of Stay by Region and State, 1951 [1]—Continued

Region and State	Beds per 1,000 population	Admissions per 1,000 population	Days of service per 1,000 population	Average length of stay (days)
East South Central	3.4	93.8	835.9	8.9
Kentucky	3.8	98.4	961.8	9.8
Tennessee	3.7	98.1	1,025.8	10.5
Alabama	2.8	87.3	658.3	7.5
Mississippi	2.9	90.2	626.7	6.9
West South Central	4.2	117.3	1,025.3	8.7
Arkansas	3.5	87.9	721.4	8.2
Louisiana	4.8	129.3	1,205.4	9.3
Oklahoma	3.4	97.2	821.0	8.4
Texas	4.5	125.9	1,093.6	8.7
Mountain	5.5	137.3	1,340.7	9.8
Montana	6.3	168.4	1,586.4	9.4
Idaho	4.1	127.9	845.1	6.6
Wyoming	6.0	183.0	1,317.7	7.2
Colorado	8.0	157.5	2,069.8	13.1
New Mexico	3.2	90.1	744.9	8.3
Arizona	5.1	132.7	1,269.8	9.6
Utah	3.5	112.1	823.8	7.4
Nevada	5.9	149.0	1,419.4	9.5
Pacific	5.2	123.2	1,399.9	11.4
Washington	5.5	149.4	1,396.2	9.3
Oregon	3.7	119.3	972.9	8.2
California	5.3	118.0	1,461.0	12.4

[1] All hospitals, exclusive of mental and tuberculosis hospitals; includes Federal general hospitals and hospital beds in institutions.

SOURCE: Computed from data in the American Medical Association's 1951 Census of Hospitals.

TABLE 4.—Civilian General Hospital Beds, Admissions and Days of Service per 1,000 Civilian Population and Average Length of Stay by Region and State, 1951[1]

Region and State	Beds per 1,000 population	Admissions per 1,000 population	Days of service per 1,000 population	Average length of stay (days)
United States	4.2	112.2	1,135.8	10.1
New England	5.0	117.4	1,318.2	11.2
Maine	3.4	99.4	891.7	9.0
New Hampshire	4.8	134.0	1,128.0	8.4
Vermont	4.7	136.0	1,217.6	9.0
Massachusetts	5.5	118.8	1,485.0	12.5
Rhode Island	4.9	93.5	1,364.8	14.6
Connecticut	4.6	123.3	1,170.7	9.5
Middle Atlantic	5.0	111.8	1,421.5	12.7
New York	5.8	119.6	1,646.3	13.8
New Jersey	4.1	95.7	1,134.2	11.9
Pennsylvania	4.4	108.2	1,235.6	11.4
East North Central	4.1	114.8	1,140.1	9.9
Ohio	3.6	106.8	1,017.3	9.5
Indiana	3.1	101.4	864.4	8.5
Illinois	4.8	121.4	1,339.7	11.0
Michigan	3.9	114.8	1,141.8	9.9
Wisconsin	4.6	132.4	1,236.8	9.3
West North Central	4.7	124.1	1,252.4	10.1
Minnesota	5.2	144.0	1,406.2	9.8
Iowa	3.6	113.2	975.8	8.6
Missouri	4.8	104.2	1,352.6	13.0
North Dakota	5.1	152.3	1,171.1	7.7
South Dakota	5.5	157.9	1,335.3	8.5
Nebraska	5.1	132.2	1,179.3	8.9
Kansas	4.8	123.9	1,231.2	9.9
South Atlantic	3.6	104.2	931.1	8.9
Delaware	6.1	125.3	1,662.2	13.3
Maryland	4.6	92.0	1,220.0	13.3
District of Columbia	8.5	188.2	2,415.8	12.8
Virginia	3.3	98.0	870.1	8.9
West Virginia	3.8	119.3	1,089.1	9.1
North Carolina	2.9	107.0	734.0	6.9
South Carolina	2.9	93.3	732.9	7.9
Georgia	2.9	95.3	695.8	7.3
Florida	3.6	100.3	866.4	8.6

See footnote at end of table.

TABLE 4.—Civilian General Hospital Beds, Admissions and Days of Service per 1,000 Civilian Population and Average Length of Stay by Region and State, 1951[1]—Continued

Region and State	Beds per 1,000 population	Admissions per 1,000 population	Days of service per 1,000 population	Average length of stay (days)
East South Central	2.9	89.1	732.7	8.2
Kentucky	2.9	89.0	735.9	8.3
Tennessee	3.6	97.1	976.2	10.1
Alabama	2.4	82.3	563.3	6.8
Mississippi	2.6	86.5	591.6	6.8
West South Central	3.6	111.2	873.1	7.9
Arkansas	2.8	82.8	563.9	6.8
Louisiana	4.6	125.4	1,151.1	9.2
Oklahoma	3.2	94.1	787.1	8.4
Texas	3.5	118.1	875.6	7.4
Mountain	4.8	132.8	1,158.8	8.7
Montana	6.4	169.8	1,600.0	9.4
Idaho	4.1	128.4	847.9	6.6
Wyoming	4.8	144.5	1,011.8	7.0
Colorado	5.7	148.2	1,440.0	9.7
New Mexico	3.2	89.9	749.9	8.3
Arizona	4.9	130.8	1,241.8	9.5
Utah	3.5	112.9	829.7	7.4
Nevada	6.1	153.5	1,462.2	9.5
Pacific	4.2	115.3	1,164.1	10.1
Washington	4.5	139.0	1,133.9	8.2
Oregon	3.7	119.8	977.3	8.2
California	4.1	109.4	1,198.0	11.0

[1] All hospitals, exclusive of military hospitals and mental and tuberculosis hospitals, includes Federal nonmilitary general hospitals and hospital beds in institutions. The civilian population is total population exclusive of members of the armed forces overseas and stationed in each State.

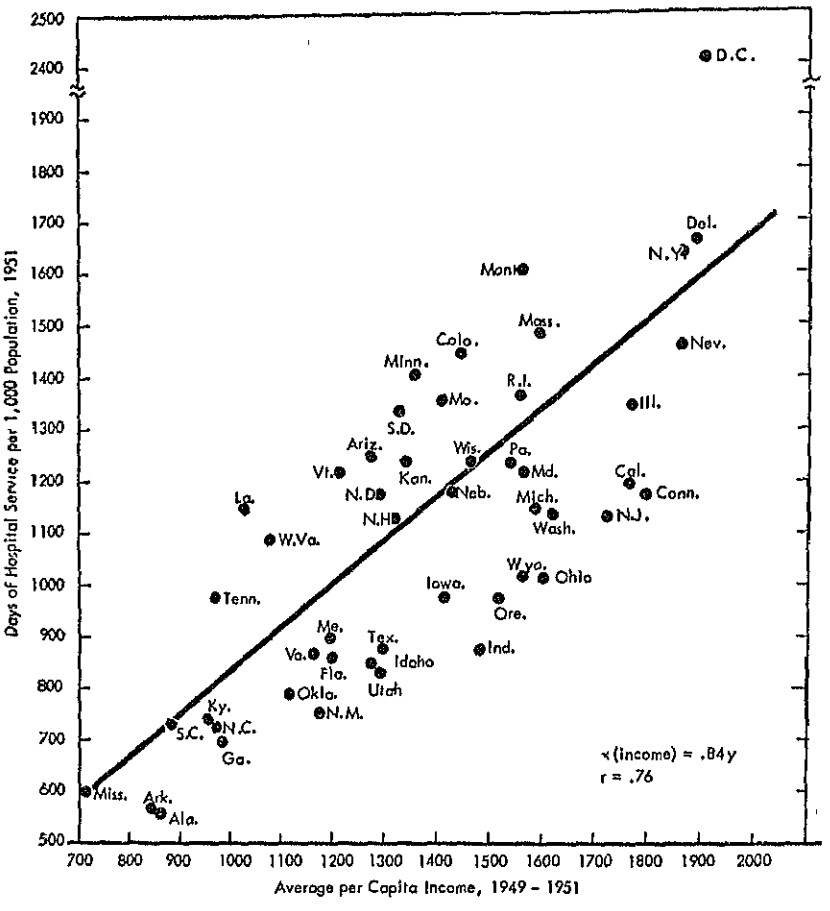
SOURCE: Computed from data in the American Medical Association's 1951 Census of Hospitals.

capita income, and low in the less prosperous States. This is indicated quite clearly by chart 5, which plots the States according to volume of service per 1,000 population and per capita income.

Chart 5.

RELATIONSHIP BETWEEN PER CAPITA INCOME AND DAYS OF HOSPITAL SERVICE

Per 1,000 Population, by State



In the second place, some of the Plains States—Montana and North and South Dakota—stand out as having a high ratio of beds to population and a high volume of admissions and service per 1,000 population. These States are, as a general rule, not among the leaders in per capita income. The explanation of this situation may lie in the same set of circumstances as is believed to be responsible for a similar high ratio of hospital beds and high utilization rates in Saskatchewan to the north, namely, that the population is so sparse

and distances are so great that doctors find it impracticable to make many home calls and so hospitalize many patients for conditions which elsewhere are generally cared for at home.

The State of Louisiana provides an interesting exception to the rule of low hospital beds and low volume of service in the poorer States. The explanation is the existence of the State program of charity hospitals under which free hospital care is provided to those of low income. The State charity hospitals provide almost half of the general hospital service provided in the State.

Another observation which may be made as regards the variation in beds and volume of service among the States is that in general (there are exceptions to this) the average length of stay is longer in the States with a high volume of service. In general these latter States are the wealthier ones where people are better able to pay for care and relatively generous provision is made for the indigent and medically indigent. It seems probable that in these States a larger proportion of chronically ill persons—persons requiring long term care—are receiving hospitalization than in the poorer States.

Long and Short Term Hospital Care

The variations among the States and regions in the supply of hospital beds and the utilization of hospital care become more understandable in the light of information on the relative proportion of care in short and long term general hospitals.

Table 5 presents data from the 1951 hospital census of the American Hospital Association showing, for the main Census regions of the country, the proportion of beds in non-Federal short term and long term general hospitals, respectively, and the volume of care in these two types of hospitals. Short term general hospitals serve primarily the acutely ill and have an average length of stay of less than 30 days. Long term hospitals care primarily for long term, chronic patients and have an average length of stay of over 30 days.[8]

[8] The tabulations of the American Hospital Association (*Hospitals, Administrators Guide Issue*, June 1952, Part 2) show a total of 304 general and special long term non-Federal hospitals in the country with a total of 62,768 beds, an average of 159 beds per hospital. About three-fourths of the hospitals are non-profit or proprietary, but 63 percent of the beds are in governmental hospitals. The average size of the governmental hospitals is 402 beds as compared with 92 beds for the non-profit and 41 beds for the proprietary hospitals. That many of these long term hospitals are not much more than custodial institutions is indicated by the relatively small proportion having facilities and services required for diagnosis and treatment, as shown below:

Type of service	Percent of hospitals having specified services			
	Non-profit	Proprietary	Governmental	Total
Clinical laboratory	38	25	61	41
Metabolism apparatus	22	10	45	28
Physical therapy department	56	25	48	40
X-ray diagnostic service	45	17	64	45

Very few of these long term hospitals have any affiliation or connection with short-term general hospitals.

TABLE 5.—Beds and Days of Care in Short and Long Term General Hospitals, 1951

Region	Total beds per 1,000 population	Percent of total beds		Percent of total days of care		Average length of stay	
		Short term hospitals	Long term hospitals	Short term hospitals	Long term hospitals	Short term hospitals	Long term hospitals [1]
						Days	*Days*
United States	3.8	89.2	10.8	88.1	11.9	8.3	114
New England	4.8	81.5	18.5	81.1	18.9	9.1	137
Middle Atlantic	4.7	82.9	17.1	81.9	18.1	10.2	170
South Atlantic	3.2	94.4	5.6	94.1	5.9	7.3	115
East North Central	3.8	87.4	12.6	86.3	13.7	8.2	86
East South Central	2.5	95.5	4.5	95.2	4.8	6.7	56
West North Central	4.2	93.6	6.4	92.5	7.5	8.4	140
West South Central	3.1	97.8	2.2	97.5	2.5	6.5	99
Mountain	4.0	94.6	5.4	94.6	5.4	7.1	56
Pacific	3.7	91.7	8.3	90.6	9.4	8.5	70

[1] It is not strictly accurate to designate this figure as average length of stay. It represents total days of care during the year divided by number of admissions during this year. Since an appreciable portion of the days of care may have been for patients admitted in prior years, the figures probably understate the true average length of stay for discharged patients.

SOURCE: Calculated from data in *Hospitals, Administrators Guide Issue*, June 1952, Part II.

The table shows that for the country as a whole 89.2 percent of all general beds (exclusive of beds in Federal hospitals) are in short term hospitals and 10.8 are in long term hospitals. However, the proportions vary widely among the different geographical regions. In general, the regions best supplied with hospital beds, i. e., the New England and the Middle Atlantic States, have the highest proportion of long term beds (18.5 and 17.1 percent, respectively) to the total. Conversely the regions least supplied with beds have the smallest proportion of beds in long term hospitals. Thus the East South Central Region (Kentucky, Tennessee, Alabama, and Mississippi) has only 4.5 percent of its total beds in long term hospitals.[4]

Hospitalization for Acute and Chronic Illness

An understanding of the present utilization of hospital care and the variation in utilization among the States requires insight into the relative proportions of this care which are for acute and chronic illness, respectively.

To be meaningful it is necessary to define terms. If by chronic disease one means the diseases of relatively long duration, such as—to mention the more important of them—heart disease, arteriosclerosis and high blood pressure, rheumatism, nephritis, and other kidney diseases, cancer and other tumors, diabetes, hay fever and asthma, and of course tuberculosis and mental disease, then such diseases account for well over 70 percent of all deaths and the major portion of all disability. On the basis of diagnosis, chronic diseases account for probably 25 to 50 percent of the days of hospitalization in all general hospitals, i. e., exclusive of mental and tuberculosis hospitals.[5]

By "chronic cases," hospital people usually do not mean all cases diagnosed as having a chronic disease, but simply those chronic disease cases which involve a long hospital stay and which after the initial phase of care require relatively little active medical treatment. Such cases comprise the patient load of the long term or chronic disease

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[4] Probably the most accurate source of information on the relative numbers of non-Federal general acute and chronic hospital beds is the State Plans submitted under the Hospital Survey and Construction program. The data for the States and regions are shown in Appendix A. These data show that of all general (acute) and chronic hospital beds, 90 percent are general and 10 percent for chronic disease. However the data are affected by various conceptions, from State to State, of what is a hospital. Some of the States have included nursing homes in their list of chronic disease facilities, and this results in a showing of chronic disease beds as a relatively high proportion of total beds. For example, Maryland shows 7,411 general acute beds and 6,102 chronic beds, or chronic beds as 45 percent of the total. Iowa shows 11,087 acute beds and 6,304 chronic beds, or chronic beds as 36 percent of the total. It should be noted that where this is done the total of all beds in relation to population becomes a fairly high figure—Maryland 5.7 beds per 1,000; Iowa 6.6 beds per 1,000. The above quoted figures include nonacceptable as well as acceptable beds.

[5] Analysis of the utilization experience of two Blue Cross plans indicates that in the one case 28 percent and in the other case 34 percent of the total days of hospitalization paid for were for chronic illness. Both figures are minimum and detailed figures of utilization by diagnosis would probably have indicated a somewhat higher proportion. A study in New York State showed that in 1940, 39 percent of the total days of hospitalization in general hospitals were due to chronic illness. (New York State Commission to Formulate a Long Range Health Program, *A Program for the Care of the Chronically Ill in New York State*, Albany, 1947, p. 51.)

hospitals. However, it is probable that as great or an even greater volume of care for this type of patient is provided in acute general hospitals, either in special chronic disease units or without segregation from other patients. The fact that the average length of stay in short term hospitals is appreciably longer in the New England and Middle Atlantic regions (see table 5) suggests that the short term general hospitals of these regions are providing considerably more care for long term chronic patients than are the acute general hospitals of other regions of the country.

How much care for chronic long term patients is provided by short term general hospitals is difficult to say. Some clue is given by the proportion of all days of hospital care due to long stay cases, say, cases with a stay of over 30 days. Under the New York City Blue Cross plan in 1948, 2.8 percent of the cases paid for had a stay of 30 days or longer; these cases entailed 16.4 percent of the total days of care paid for by the plan.[6] In Saskatchewan, Canada, under that Province's hospital service program, about one third of all days of care in 1951 was provided to cases with a stay of 30 days or more.[7] Under the similar program in British Columbia the proportion was 29.4 percent.[8] The average length of stay in the general medical and surgical beds of the Veterans Administration is 30 days; 30 percent of the patients have a stay of over 30 days and these cases entail considerably more than 50 percent of the total days of service provided.[9]

The important thing to realize is that chronic illness makes up an important part of the patient load of the general hospital.

Nursing, Convalescent and Old Age Homes

This statistical picture of the Nation's existing supply of hospital beds and the present utilization of hospital service would not be complete without taking cognizance of nursing and convalescent homes and homes for the aged—places which are playing an important role in the care of the chronic sick. Nursing homes, i. e., homes providing nursing care, have developed on a large scale within the last 20 years. Relatively little is known about these homes, the characteristics of the patients or residents and the type of service provided. There is abundant evidence that in many instances hospitals, both short and long term, are caring for patients who might be just as well or even better cared for in nursing homes or places offering a similar type of care, and that there are probably considerable numbers of patients

[6] Associated Hospital Service of New York, mimeographed table made available by the Plan.
[7] Department of Public Health of the Province of Saskatchewan, *Annual Report, Saskatchewan Hospital Service Plan, 1951*, p. 21.
[8] British Columbia Hospital Insurance Plan, *Cases Discharged by Length of Stay According to Specified Age Groups and Marital Status, 1951* (Dittoed).
[9] Administrator of Veterans Affairs, *Annual Report, 1952*, pp. 155, 157.

in nursing homes who belong in hospitals. In some States and cities long term chronic patients are being cared for predominantly in chronic disease hospitals, and elsewhere apparently the same type of patient is being cared for in nursing homes.[10]

Any attempt to give an account of the number of nursing homes and their bed capacity is rendered difficult by the fact that one is dealing with an ill-defined type of "home" which is not clearly differentiated from such places as boarding homes for the aged, old age homes, public "poor-farms" and almshouses, Old Soldiers' Homes, and similar facilities. Many of these latter types of places are apparently providing nursing care, in greater or less degree, to some of their residents and are thus, to an extent, nursing homes.

Table 6 shows data on the number of nursing and old age homes and their bed capacity in some 22 States. Mainly these figures have been obtained from State lists of licensed "nursing homes" or of homes applying for license. Licensure provisions differ from State to State, as does the definition of a "nursing home." In some States only places giving an appreciable degree of nursing care are licensed; old age homes are excluded. In some States the health department licenses nursing homes, and old age homes and other institutions of a domiciliary type are licensed by the welfare department and do not enter into the lists obtained. In some instances only private nursing and old age homes and not public homes and institutions are licensed. Hence the figures presented are to be regarded only as approximations; they include more than nursing homes and less than the entire gamut of nursing homes, old age homes and similar homes or institutions for the infirm, aged, and dependent.

The data, such as they are, show that in the 22 States as a whole there were 4,500 homes with some 98,400 beds—1.6 beds per 1,000 population. These figures would indicate that in the country as a whole there are probably no less than 238,000 beds in nursing, convalescent, and old age homes. From close inspection of the lists for various States, it appears that probably something over half of these beds would be in places designated by the owner as a "nursing home", "convalescent home" or "rest home."

Another and probably more accurate source of information on the number of persons in nursing and old age homes and related institutions is the 1950 Census of Population. Preliminary data from the Census show a total of 296,783 persons (as of April 1, 1950) in what the Census calls "Homes for the Aged and Dependent," about 2

[10] For example, New York City has about 1 bed in chronic disease hospitals per 1,000 population and is reported to have relatively few nursing homes; Washington and Oregon have few beds in long term hospitals but have relatively large numbers of beds in nursing homes.

TABLE 6.—Nursing, Convalescent and Rest Homes, Old Age Homes, and Similar "Homes" and Institutions in Various States

State	Population	Number of homes	Number of beds	Number of beds per 1,000 population
Alabama	2, 991, 000	36	1, 037	.35
Arkansas	1, 892, 000	18	450	.24
California	10, 643, 000	451	8, 706	.82
Colorado	1, 334, 000	134	2, 636	1.98
Connecticut	2, 026, 000	236	5, 162	2.55
Idaho	588, 000	70	1, 049	1.78
Illinois	8, 746, 000	560	19, 000	2.17
Indiana	4, 000, 000	259	3, 862	.97
Iowa	2, 624, 000	477	6, 808	2.59
Maine	885, 000	164	1, 868	2.11
Maryland	2, 360, 000	137	4, 641	1.97
Minnesota	2, 990, 000	288	9, 088	3.04
Nebraska	1, 342, 000	250	4, 447	3.31
New Hampshire	531, 000	159	3, 107	5.85
New Jersey	4, 899, 000	100	2, 080	.42
Oklahoma	2, 229, 000	123	2, 226	1.00
Oregon	1, 550, 000	160	3, 917	2.53
South Dakota	641, 000	67	1, 104	1.72
Tennessee	3, 297, 000	93	1, 379	.42
Utah	703, 000	69	1, 277	1.82
Washington	2, 343, 000	265	7, 438	3.17
Wisconsin	3, 452, 000	390	7, 128	2.06
Total—22 States	62, 066, 000	4, 506	98, 410	1.59

SOURCE: Data from various sources, mainly State lists of licensed "nursing homes." Types of homes and institutions included, e. g., old age homes, county and city poor farms and infirmaries varies from State to State. Data compiled by Mrs. Belvera Mack of the Division of Medical and Hospital Resources.

persons per 1,000 population. About 73 percent of these persons were 65 and over. The detailed figures by ownership of the homes, and number and percent of residents over 65 are as follows:

Type of ownership	Number of persons	Number 65 and over	Percent 65 and over
Federal and State	41, 811	14, 218	34.0
Local governmental	72, 439	46, 206	63.8
Private, nonprofit	71, 249	65, 204	91.5
Private, proprietary	111, 284	91, 908	82.6
Total	296, 783	217, 536	73.3

The Federal and State "homes" are largely domiciliaries of the Veterans Administration and State "Old Soldiers' Homes."[11] The local governmental facilities include county and city "homes" and poor farms and public old age homes, infirmaries, etc. The private, nonprofit homes are probably mainly homes for the aged but include some nursing homes. The private, proprietary homes include nursing homes, convalescent and rest homes, boarding homes and foster homes for aged persons.[12]

Table 7 shows the number of persons in the various types of homes by State and the total number of persons in all types of homes per 1,000 of the general population and per 1,000 of the population 65 and over. It will be seen that the resident population in these institutions per 1,000 population is relatively greater in the wealthier States. There is less variation among the Sates in the number of such persons per 1,000 of the population 65 and over, than in the number per 1,000 of the total population.

The persons included in this census classification range all the way from persons who are completely bedridden and who require a great deal of personal assistance and nursing care to persons who are fully ambulatory, in good possession of their faculties, and require not much more than a place to live. It is difficult to estimate from these or other figures the number of persons who are receiving what may be called a nursing home type of care, i. e., who are bedridden or semi-ambulatory and require appreciable nursing and personal care. The figures

[11] There are about 17,000 persons resident in VA "domiciliaries."

[12] Surveys of nursing homes and nursing home patients in a few States are beginning to give a picture of the type of patients in these homes and the services and care they need. Thus a joint survey of the Commission on Chronic Illness and the Maryland State Health Department found that of the patients in proprietary nursing homes one quarter are 85 years of age and over, and two-thirds are over 75. Seventy-three percent are women. Two-fifths are confined to bed all or a large part of the time. One-fifth are mentally confused most or all of the time. One-third are incontinent of feces or urine or both. Nine-tenths receive assistance in personal daily tasks (bathing, dressing, eating, etc.). Only three percent require no nursing service. Leading primary diagnostic conditions, as reported by nursing home operators, are "senility, hemiplegia, heart disease, circulatory disease." (Commission on Chronic Illness, *Survey of Nursing Care Patients in Institutions, Maryland Pilot Study, Summary Data, Proprietary Nursing Homes,* May 1953, mimeographed.)

A survey of nursing homes in California found that 5 percent of the patients were ambulatory and required no specific care; 37 percent were ambulatory but required some assistance and attention; 29 percent were bedfast and 36 percent were bed patients but could get out of bed or be assisted out of bed at least once every day. Forty-four percent were able to take tub baths, the remainder requiring bed baths. Twenty percent were on special diets. Thirty percent required assistance with eating. Thirty-one percent were incontinent. Sixty-eight percent were getting some type of medication. (Hotchkiss, Bernice, *Nursing Homes: An Analysis of the Types of Patients Accommodated and Nursing Services Provided,* California's Health, State Department of Health, Nov. 30, 1952.)

A survey in 1949 of proprietary nursing homes in New York State found that 87 percent of the residents or patients were 65 and over, and half over 75. Sixty-two percent were ambulatory, able to get about; 55 percent were public charges. The population in the homes constituted "a group of persons of advanced years with progressively deteriorating conditions of chronic character requiring nursing care." The homes could be classified into three groups: 1. Nursing homes for care of the sick and infirm who require fairly intensive and skilled nursing care but who do not require the highly organized surgical and medical facilities of a hospital; 2. foster homes for aged, like homes for the aged, equipped to care for chronically ill, aged and infirm persons who need assistance in bathing, dressing and getting about, but who can get along without professionally skilled nursing care; 3. boarding homes, comprising establishments equipped to provide care to aged and infirm persons who require a minimum of personal assistance and care in a pleasant environment simulating that of a desirable family home. (New York State Department of Social Welfare. *A Survey of 754 Proprietary Nursing and Boarding Homes for Adults in New York State,* Nov. 21, 1950.)

TABLE 7.—Persons in Homes for the Aged, Nursing and Convalescent Homes, Public "Homes" and Similar Facilities for the Aged and Dependent, 1950

Region and State	Total	Federal [1] and State	County and city	Private nonprofit	Proprietary nursing and rest homes, etc.	Total number per 1,000 population	Total number per 1,000 population 65 and over
United States	296,783	41,811	72,439	71,249	111,284	1.97	24.19
New England	30,414	2,802	5,318	6,485	15,809	3.27	33.54
Maine	2,235	443	76	412	1,304	2.45	23.89
New Hampshire	2,466	203	955	454	854	4.62	42.60
Vermont	820	106	138	146	430	2.17	20.74
Massachusetts	15,674	337	2,874	3,657	8,806	3.34	33.46
Rhode Island	1,761	223	60	521	957	2.22	25.01
Connecticut	7,458	1,490	1,215	1,295	3,458	3.72	42.18
Middle Atlantic	73,071	5,530	21,790	24,039	21,712	2.42	28.78
New York	38,403	4,480	10,019	13,397	10,507	2.59	30.52
New Jersey	8,314	177	2,563	2,327	3,247	1.72	21.10
Pennsylvania	26,354	873	9,208	8,315	7,958	2.51	29.72
East North Central	69,368	9,135	19,907	16,758	23,568	2.28	26.72
Ohio	22,025	3,218	7,931	4,025	6,851	2.77	31.07
Indiana	8,963	907	3,231	1,687	3,138	2.28	24.83
Illinois	20,235	1,624	5,358	6,680	6,573	2.32	26.83
Michigan	10,552	1,314	2,508	2,411	4,319	1.66	22.86
Wisconsin	7,593	2,072	879	1,955	2,687	2.21	24.50

West North Central	37,756	5,351	8,007	8,494	15,904	2.69	27.40
Minnesota	7,683	583	1,545	2,582	2,973	2.58	28.53
Iowa	8,952	1,723	2,633	1,487	3,109	3.42	32.77
Missouri	9,728	345	2,725	2,157	4,501	2.46	23.88
North Dakota	1,315	197	90	523	500	2.12	27.28
South Dakota	1,996	954	66	215	761	3.06	36.10
Nebraska	3,706	455	115	678	2,458	2.80	28.42
Kansas	4,376	1,094	833	847	1,602	2.30	22.53
South Atlantic	24,036	6,775	4,432	5,559	7,270	1.13	17.20
Delaware	462	------	------	246	216	1.45	17.55
Maryland	3,684	76	429	1,557	1,622	1.57	22.52
District of Columbia	2,780	1,980	------	658	142	3.47	48.93
Virginia	4,723	1,918	730	923	1,152	1.42	22.01
West Virginia	2,406	832	537	334	703	1.20	17.37
North Carolina	2,965	418	1,497	295	755	.73	13.16
South Carolina	952	165	265	247	275	.45	8.28
Georgia	2,191	622	556	424	589	.64	9.97
Florida	3,873	764	418	875	1,816	1.40	16.31
East South Central	10,819	3,662	3,347	1,626	2,184	.94	13.17
Kentucky	2,658	150	826	791	891	.90	11.31
Tennessee	5,535	2,530	1,828	421	756	1.68	23.56
Alabama	1,062	------	386	204	472	.35	5.35
Mississippi	1,564	982	307	210	65	.72	10.23
West South Central	9,459	1,731	1,058	2,021	4,649	.65	9.16
Arkansas	726	77	349	96	204	.38	4.87
Louisiana	1,483	41	119	881	442	.55	8.39
Oklahoma	1,541	165	111	146	1,119	.69	7.95
Texas	5,709	1,448	479	898	2,884	.74	11.12

See footnote at end of table.

TABLE 7.—Persons in Homes for the Aged, Nursing and Convalescent Homes, Public "Homes" and Similar Facilities for the Aged and Dependent, 1950—Continued

Region and State	Total	Federal [1] and State	County and city	Private nonprofit	Proprietary nursing and rest homes, etc.	Total number per 1,000 population	Total number per 1,000 population 65 and over
Mountain	6,171	767	1,040	612	3,753	1.22	17.20
Montana	879	67	280	195	337	1.49	17.27
Idaho	874	------	196	53	625	1.48	20.07
Wyoming	212	59	35	------	118	.73	11.67
Colorado	2,225	119	85	349	1,673	1.68	19.25
New Mexico	192	122	------	7	63	.28	5.81
Arizona	951	319	95	8	529	1.27	21.49
Utah	615	81	232	------	302	.89	14.50
Nevada	223	------	117	------	106	1.39	20.30
Pacific	35,689	6,058	7,540	5,656	16,435	2.46	28.79
Washington	6,678	703	271	1,253	4,451	2.81	31.58
Oregon	3,871	657	459	703	2,052	2.54	29.10
California	25,140	4,698	6,810	3,700	9,932	2.37	28.09

[1] Includes persons in the Domiciliary Facilities of the Veterans Administration; as of June 1952 there were some 17,000 persons cared for in these facilities.

SOURCE: Bureau of the Census, 1950 Census of Population. Preliminary unpublished data

show that 37 percent of the total are in commercial homes, and it is believed on the basis of the lists of nursing homes in various States that the majority of these are in nursing homes. There are some nonprofit nursing homes and many of the nonprofit old age homes have infirmaries for patients or residents requiring nursing care. The same is true of some of the State and local governmental institutions. On the whole, it may be estimated that perhaps half of the persons in all types of homes are receiving what may be called a nursing home type of care.

In conclusion: There are about 2 persons per 1,000 population in nursing homes, homes for the aged and similar places for the aged, infirm and dependent. These persons, in a sense, are all chronically ill, and they probably constitute the bulk of the chronic sick who require long term institutional care. Probably in the neighborhood of half of these are now receiving a nursing home type of service. On the basis of this assumption it may be concluded that in the country as a whole there is approximately one occupied nursing home type of bed per 1,000 population and that these beds are providing about 365 days of nursing home care per 1,000 population per year. These facilities constitute an appreciable part of the institutional facilities now serving the chronic sick.

Elderly People in Mental Hospitals

In considering the existing facilities now providing general care, some consideration needs to be given to the large numbers of elderly persons in mental hospitals. Of the 613,000 persons in mental institutions in 1950, 141,000 were 65 years of age and over.[13] The number of persons 65 and over in these institutions has increased by 61 percent since 1940. In 1949 of the 104,000 first admissions to State mental hospitals approximately 25,000, or 24 percent, were admissions of persons 65 and over. Of these admissions, 10,500 had the diagnosis of "senile, with psychoses."[14]

Many observers believe that an appreciable number of these elderly patients do not belong in mental hospitals. Thus at a recent Conference of State Commissions on Aging and Federal Agencies there was agreement that—

> There is an alarming increase in the number of aging and aged people admitted to our mental institutions, many of whom might be better cared for by utilizing community medical or domiciliary facilities. This is putting a terrific strain on both our existing facilities and our economic resources.[15]

Great concern was also expressed over the large number of elderly persons committed to State mental hospitals during periods of extreme disturbance who

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[13] 1950 Census data.
[14] Public Health Service, *Patients in Mental Institutions*, 1949, p. 39.
[15] Committee on Aging and Geriatrics, Department of Health, Education, and Welfare, *Report of the Conference of State Commissions on Aging and Federal Agencies, Sept. 8–10, 1952*, 1953, p. 41.

cannot then be returned to the community after they have achieved a substantial recovery. In Massachusetts, it was stated, there are probably more than 3,000 such patients at present who could live outside an institution, providing the right living arrangements were worked out. The same problem exists in other States.[18]

A recent study by the California State Department of Mental Hygiene showed that of 200 patients over the age of 60 admitted to State mental hospitals during June 1950 more than one-third were nonpsychotic and should have been cared for elsewhere than in a mental hospital.

If it is correct that there are large numbers of elderly patients in mental hospitals who could be better cared for in their local communities in old age homes, nursing homes or hospitals, then that fact indicates an increased need for these latter types of facilities.

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[18] *Ibid.*, p. 43.

4. An Estimate of the Volume of Service Needed

An estimate of the number of general hospital beds required by the population should, it would seem, be developed in two steps: (1) an estimate of the volume of hospital service required for the provision of adequate health service to the population; and (2) an estimate of the number of beds required, under conditions of effective planning and utilization of hospital facilities, to provide this volume of service.

There does not appear to be any feasible method of measuring directly the volume of hospital service needed by the population. Estimation of need through the methods used by Lee and Jones (utilization of morbidity rates to estimate the number of cases requiring hospital care and the volume of service required) is both costly and, because of the numerous estimations involved, likely to yield dubious results. Lacking any direct measure of need, the only feasible way of estimating the volume of service needed is to consider the volume of service utilized by different population groups which are believed to be receiving adequate health service or where, at any rate, the economic circumstances are such that effective demand is equal to or approaches real need.

Five main experience bases appear to be available. (1) the volume of service utilized in the States in which virtually all births take place in hospitals; (2) the volume of service utilized in the States with the highest per capita incomes; (3) the volume of service utilized under the Blue Cross hospital prepayment plans; and (4) and (5) the volume of service used under the province-wide hospital service or insurance programs in Saskatchewan and British Columbia, Canada, respectively.

Volume of Service Utilized in States Where Virtually All Births Take Place in Hospitals

In 1949, 86.7 percent of all live births took place in hospitals. There were nine States in which over 98 percent of all births took place in hospitals. On the assumption that all births should take place in hospitals, it would appear that in these States the population is receiving close to adequate (from a sheer quantitative standard) hospital care for childbirth. It might be argued that if the people in these States receive as much hospital care as is needed for childbirth, it is likely that they also receive close to an adequate volume of hospital service for other conditions. At any rate the volume of service utilized in these States may give some indication of the volume of service needed. The people of these nine States in 1951 had 117.6 admissions to civilian hospitals and received 1,390 days of care in such hospitals

TABLE 8.—Days of General Hospital and Nursing Home Care per 1,000 Population in the States in Which Over 98 Percent of All Births Take Place in Hospitals

States	Civilian population 1951	Days of care per 1,000 population					
		Non-Federal hospitals		Federal civilian hospitals [2]	All civilian hospitals [3]	Nursing home care [4] estimated	Total hospital and nursing home care
		Short term [1]	Long term [1]				
New Hampshire	531, 000	1, 056	13	59	1, 128	840	1, 968
Massachusetts	4, 671, 000	1, 112	342	31	1, 485	621	2, 106
Rhode Island	767, 000	838	403	124	1, 365	402	1, 767
Connecticut	2, 026, 000	981	150	40	1, 171	694	1, 865
New York	14, 960, 000	1, 212	310	124	1, 646	475	2, 121
Utah	703, 000	714	27	89	830	146	976
Washington	2, 343, 000	949	10	175	1, 134	511	1, 645
Oregon	1, 550, 000	858	27	92	977	475	1, 452
California	10, 643, 000	951	126	121	1, 198	438	1, 636
Total and average	38, 194, 000	1, 065	217	108	1, 390	475	1, 865

[1] Calculated for each State from data in *Hospitals, Administrators Guide Issue*, June 1952.
[2] Approximate. This figure is the difference between the total days of non-Federal short and long term hospital care, and total days of hospital care derived from A. M A. hospital census data.
[3] All hospital care in civilian hospitals exclusive of tuberculosis and mental hospitals, as shown by A. M A hospital census data (see table 4)
[4] Rough estimate on the presumption that in each State half of the persons found by the Census in "homes for the aged and dependent" (see table 7) are receiving a nursing home type of care. Estimated number of persons per 1,000 population times 365 equals annual days of care

per 1,000 of the civilian population. This is considerably above the national average of 112 admissions and 1,135 days of service per 1,000 civilian population.

As shown in table 8, of the 1,390 days of service per 1,000 population in these States, approximately 1,065 days were provided in short term non-Federal hospitals, 217 in long term non-Federal hospitals, and 108 in Federal civilian hospitals. The bulk of the care in Federal hospitals is provided by the Veterans Administration facilities. VA general medical and surgical patients have an average patient stay of 30 days, which indicates that a considerable share of the care is for chronic long term patients. Apportioning the Federal care between short and long term hospitals on what appears to be a reasonable basis, the 1,390 days of service breaks down roughly into 1,128 days of care in short term and 262 days of care in long term hospitals.[1]

In these same States there were at the time of the Census in 1950 an average of 2.67 persons per 1,000 population in homes for aged and dependent. If it is assumed that half of these were receiving a nursing home type of care, then it may be calculated that the population of these States annually receives about 475 days of nursing home care per 1,000 population (1.3 times 365). The total volume of care in hospitals and nursing homes comes to 1,865 days per 1,000 population.

Volume of Service Received in the States With Highest Per Capita Incomes

Since the use of hospitals depends in part upon economic circumstances, some indication of the volume of service needed may be obtained by considering the volume of service utilized in the most prosperous States. Here the people are best able to afford the service needed, and governmental and philanthropic agencies tend to have the largest resources for providing care to those unable to provide for themselves.

Table 9 shows the volume of service received in the one quarter of the States (excluding the District of Columbia) which during the period 1949–1951 had the highest average per capita income. These 12 States in 1951 contained about 40 percent of the Nation's total population. The people of these States in 1951 had 115 admissions to civilian general hospitals and received 1,310 days of service per 1,000 of the civilian population. It should be noted that utilization in these 12 States to a considerable degree reflects utilization

[1] Almost all of the PHS and Indian Service hospitals are definitely short term. The VA general care has been assumed to be half short term and half long term. On this presumption it is calculated that 58 percent of the Federal care is short term and 42 percent long term.

TABLE 9.—Days of General Hospital and Nursing Home Care per 1,000 Population in the 12 Most Prosperous States, 1951

States	Civilian population 1951	Days of care per 1,000 population					
		Non-Federal hospitals		Federal civilian hospitals [2]	All civilian hospitals [3]	Nursing home care [4] estimated	Total hospital and nursing home care
		Short term [1]	Long term [1]				
Delaware	325,000	890	507	265	1,662	256	1,918
New York	14,960,000	1,212	310	124	1,646	475	2,121
Nevada	166,000	1,137	24	301	1,462	256	1,718
Connecticut	2,026,000	981	150	40	1,171	694	1,865
Illinois	8,746,000	1,056	182	102	1,340	438	1,778
California	10,643,000	951	126	121	1,198	438	1,636
New Jersey	4,899,000	1,016	222	(5)	[5] 1,134	329	1,463
Washington	2,343,000	949	10	175	1,134	511	1,645
Ohio	8,047,000	862	86	69	1,017	511	1,528
Massachusetts	4,671,000	1,112	342	31	1,485	621	2,106
Michigan	6,524,000	816	322	4	1,142	292	1,434
Wyoming	285,000	870	--------	142	1,012	146	1,158
Total and average	63,635,000	1,019	213	78	1,310	438	1,748

[1] Calculated for each State from data in *Hospitals, Administrators Guide Issue*, June 1952.
[2] Approximate. This figure is the difference between the total days of non-Federal short and long term hospital care, and total days of hospital care derived from A. M. A. census data.
[3] All hospital care in civilian hospitals, exclusive of mental and tuberculosis hospitals, as shown by A. M. A. census data (see table 4).
[4] Rough estimate based on presumption that in each State half of the persons found by the Census in "homes for the aged and dependent" (see table 7) are receiving a nursing home type of care. Estimated number of persons per 1,000 population times 365 gives annual number of days of care.
[5] Sum of care in short and long term hospitals as derived from A. H. A. census is greater than total of all hospital care as shown by A. M. A. census.

in the heavily populated States of New York, California, Illinois, Ohio, Michigan, Massachusetts, and New Jersey.

It is doubtful whether all the people in these 12 States receive all the general hospital care they need. Even in Delaware and New York, which lead all the States in volume of care received, there are undoubtedly people with low or moderate incomes who are restrained by economic considerations from obtaining needed care. Further, if the people of New York use 1,642 days of service per 1,000 population, why do people in Ohio use only 1,017 days of service?

Of the 1,310 days of hospital service per 1,000 population in these States, 1,019 took place in short term non-Federal hospitals, 213 in long term non-Federal hospitals and 78 in Federal hospitals. Apportioning the Federal care on the same basis as before gives 1,064 days in short term and 246 days in long term hospitals.

In these States there was an average of 2.44 persons per 1,000 population in homes for the aged and dependent. On the assumption that half of these were receiving a nursing home type of care, there were 438 days of nursing home care per 1,000 population, and a total of 1,748 days of hospital and nursing home care annually.

Experience Under the Blue Cross Prepayment Programs

Inability to afford the cost probably constitutes the major barrier to the receipt of needed hospital service. Under prepayment programs, this economic barrier has been largely removed for those individuals belonging to the programs. The experience of these plans as to the days of service provided to enrolled participants therefore offers an important yardstick for measuring the population's hospital care needs.

In using this yardstick one must be alert to the possibility, as are an increasing number of hospital prepayment plan executives, that the volume of service utilized may under some conditions be in excess of that actually needed. Where there is no direct cost to the patient and the physician who recommends hospitalization has no direct interest in the economical use of hospital facilities, some patients may be hospitalized for their own convenience or that of the physician when the conditions of these patients could be diagnosed or treated just as effectively without in-patient hospital care. Similarly, indifference or the convenience of the patient or physician may lead to some patients staying longer than necessary.

The 80 odd Blue Cross hospital service plans in this country now have a total enrollment of over 40,000,000. The hospital utilization experience under these plans varies widely from one plan to another.

However, for all plans reporting experience data to the Blue Cross Commission, the admission rate in 1951 was 123 per 1,000 participants, the average number of days paid for per admission was 7.52, and the total number of days of in-patient care per 1,000 participants was 905.

Over the past 10 years, as indicated by the data set forth below, the admission rate has increased by some 14 percent, the length of stay has remained about the same, and the days of care per 1,000 participants has increased in about the same measure as the admission rate.[2]

Utilization experience under Blue Cross plans, 1942–51 [3]

Year	Admissions per 1,000 participants	Average days paid for per case	Days of care paid for per 1,000 participants
1942	108	--------	--------
1943	106	7.55	802
1944	103	7.26	749
1945	107	8.08	862
1946	111	8.30	923
1947	--------	--------	887
1948	117	7.66	896
1949	118	7.55	880
1950	121	7.51	895
1951	123	7.52	905

The Blue Cross utilization rates are for a selected population which is receiving less than complete hospital care. These rates must therefore be adjusted before they can be considered to represent the total need for service of the general population. The adjustments which appear to be necessary and the basis for them are as follows:

1. *Limitations on Duration of Hospitalization Provided.* Adjustment must be made for the fact that the plans provide hospitalization for only a specified number of days per benefit year or case, and that the above-reported rates do not show the total volume of hospital service received by subscribers but only that portion which is paid for, in whole or in part, by the plans. Most of the plans provide full benefits for 21 to 30 days and partial benefits for a certain number of days (frequently 30 to 60) thereafter. The majority of plans apparently provide in the neighborhood of 60 to 90 days of full or partial benefits per year or per case.

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[2] The utilization trend reflects in part changes in plan benefits. During the period many of the plans have increased the number of days of hospitalization provided as benefits; this would tend to be reflected in increased utilization rates. Over this period there has been a great increase in surgical and in-hospital medical insurance. Experience shows that every diminution of the financial barriers to care tends to result in increased utilization rates

[3] Data from the Blue Cross Commission. Admissions times length of stay does not in every case equal days of care paid for due to incomplete reporting from source plans.

If we assume that the reported Blue Cross utilization rates are roughly equivalent to those which would be found if all the plans provided benefits for up to 60 days per case, then we can utilize the experience under the Saskatchewan hospital care insurance program to estimate the days of service which would be utilized beyond this limit. Under the Saskatchewan program the days of care that were in excess of 60 days in any one stay amounted in 1951 to 10.7 percent of the total days of care.[4] On the assumption that the Blue Cross utilization rate is equal to 89.3 percent of the rate which would be found if all days of service were included, the adjusted rate would equal 1,013 days per 1,000 participants.

2. *Underutilization Due to Partial Benefits.* As indicated above many of the plans provide *full* benefits for only 21 or 30 days per year or per admission.[5] After the subscriber has exhausted his full benefit period he must pay half or thereabouts of the cost of any additional period of service and thus the economic factor may stand in the way of his receiving all the care that may be needed. There is no precise way of estimating the underutilization of care among Blue Cross subscribers on this account. By way of some allowance we can assume that the Blue Cross utilization as indicated above is too low by 5 percent. To adjust would require the addition of 51 days of service per 1,000 population.

3. *Underrepresentation of Low Income Groups.* Some adjustment needs to be made for the apparent fact that people in the lowest income strata, because of higher illness rates and poorer home conditions, require more than an average volume of hospital service, and that this group is not fully represented among Blue Cross subscribers.

The Blue Cross enrolled population includes none or few who are in receipt of public assistance or relief, and this group is known to have a high hospital utilization rate, at least when needs are met. Studies conducted during the depression years showed that persons on "relief" and very low income families received about 30 to 40 percent more days of hospital service than persons in families of all income levels combined.[6] An earlier study made by the Committee on the Costs of Medical Care in 1928–31 found that families in the lowest income group, under $1,200, who were estimated to comprise 15 percent of the whole population at that time, received approximately 24 percent more days of hospital service than the population

[4] Province of Saskatchewan, Department of Public Health. *Annual Report of the Saskatchewan Hospital Services Plan, 1951.* Regina, 1952, p. 49.

[5] In 1949, 32 percent of Blue Cross enrollees were insured for 21 days of full benefits, 34 percent for 30 days, 8 percent for 31 days and the remainder for 40 days and over. Senate Committee on Labor and Public Welfare. *Health Insurance Plans in the United States.* U. S. Government Printing Office, 1951. Part I, p. 46.

[6] Britten, Rollo H. The National Health Survey; Receipt of Medical Services in Different Urban Population Groups. *Public Health Reports,* November 20, 1940, pp. 2210–2211, 2213; also Klem, Margaret C., *Medical Care and Costs in California in Relation to Economic Status.* State Relief Administration of California, San Francisco, 1935. p. 87.

as a whole.[7] If we assume that the poorest 15 percent of the population at the present time is not represented, to any appreciable extent, in the Blue Cross enrollment, and that this group has a need for hospitalization approximately 25 percent greater than the average, then an adjustment of the Blue Cross utilization rate by addition of 40 days per 1,000 population would be required.

4. *Underrepresentation of Aged.* Various surveys show that persons of advanced years, i. e., 65 and over, utilize from 2 to 3 times as much hospital care as the general population. For example, utilization data from the Maryland Blue Cross plan show that persons over 65 used 1,601 days per 1,000 population at risk, as against 772 per 1,000 for the total enrolled population.[8] In Saskatchewan persons over 65 used in 1951, 7,485 days per 1,000 population, or over 3 times the utilization rate of the whole covered population.[9]

The aged are underrepresented in the Blue Cross enrollment. Approximately 8.1 percent of the whole United States population is 65 and over. Data on Blue Cross enrollment in 15 States and the District of Columbia indicate that in these States 2.1 percent of the Blue Cross enrollment is 65 and over.[10] On the assumption that persons 65 and over will utilize 2½ times as much care as the general population, it would be necessary to increase the Blue Cross utilization rate by 96 days per 1,000 population, in order to make this rate apply to the whole population.

5. *Care in Veterans Hospitals.* The Blue Cross utilization rate also needs to be adjusted for the fact that this rate does not include days of hospitalization furnished to veterans in Veterans Administration facilities. In 1951 approximately 11,600,000 days of general hospital care were provided in VA facilities, or 77 days per 1,000 of the general population. It is probable that a substantial volume of this care was provided to persons who are Blue Cross members, and who utilized veterans' facilities in preference to their local hospitals or because they had exhausted the benefits available under their membership. If we assume that one-third of this care in veterans' hospitals was used by Blue Cross participants, then the Blue Cross utilization rate must be increased by approximately 26 days per 1,000 population to reflect total utilization in all facilities.

6. *Workmen's Compensation.* It is estimated that, in 1951, 4,500,000 days of general hospital care were provided to workmen's

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[7] Falk, I. S.; Klem, Margaret C.; and Sinai, Nathan. *The Incidence of Illness and the Receipt and Costs of Medical Care Among Representative Families.* Chicago: University of Chicago Press, 1933, pp. 27, 283. (Committee on the Costs of Medical Care Publication No. 26.)

[8] Reed, Louis S. *Blue Cross and Medical Service Plans.* U. S. Public Health Service, 1947, p. 116.

[9] *Annual Report of the Saskatchewan Hospital Services Plan, 1951, op. cit.,* p. 47.

[10] *Health Insurance Plans in the United States, op. cit.,* Part 1, p. 99. The figure cited is a weighted average for the 15 States and D. C.

compensation cases.[11] This is equal to 30 days of care per 1,000 of the general population and must be added to the Blue Cross utilization rate to make the latter reflect total need.

In summary, the adjustments which must be made to bring Blue Cross utilization rates to a point where they roughly represent "needed" service for the entire population are as follows:

	Days per 1,000 population
Present Blue Cross utilization rate	905
1. Adjustment for days beyond 60 in any one stay	108
2. Adjustment for underutilization because full benefits are available only for 21 to 30 days in most plans	51
3. Adjustment for underrepresentation of low income groups requiring more service than average	40
4. Adjustment for underrepresentation of persons aged 65 and over	96
5. Adjustment for service provided in VA hospitals	26
6. Adjustment for service for workmen's compensation cases	30
	1,256

The adjusted Blue Cross experience comes to 1,256 days per 1,000 population. This is less than the volume of service now being received in the twelve most prosperous States, a fact which would seem to indicate that the adjustments made have been too conservative.[12]

Experience Under Saskatchewan (Canada) Hospital Services Plan

Another indication of the volume of hospital service needed by the general population is afforded by the experience in Saskatchewan, Canada, under that Province's program of universal hospital care

[11] Preliminary estimates of the Social Security Administration indicate that medical and hospital payments under workmen's compensation amounted in 1951 to $232,000,000. On the assumption that one-third of this went for hospital care, at a cost of $17 per day, it may be calculated that about 4,500,000 days of hospital care were provided.

[12] It is sometimes stated that hospital utilization under Blue Cross would be lower if the participants also had the benefit of the provision of comprehensive physicians' service on a prepayment basis. The reasoning behind such statements is that under hospitalization insurance with or without coverage of physicians' service in the hospital, there may be a tendency for persons to go into the hospital for diagnostic services, since they can receive these services in the hospital under the insurance. With comprehensive coverage of physicians' service people, it is argued, could obtain these services without direct cost in physicians' offices, and would not be under pressure to enter the hospital unnecessarily.

Some test of this idea is provided by the hospital experience of the members of the Health Insurance Plan of Greater New York, a prepayment plan providing complete physicians service. Dr. Neva Deardorff, Director of Research of this plan, reports that the hospital utilization experience of the members of this plan is practically the same as that for the entire membership of the New York Blue Cross plan. (Letter to L. S. Reed, Oct. 3, 1952.) The limited data available, and the many complicating factors that have to be taken into account make any generalization on this point difficult.

It has also been suggested that under situations in which physicians had a direct interest in holding hospitalization to a minimum consistent with good care, the volume of hospitalization might be reduced. In order to obtain some test of this idea a comparison was made of the hospital utilization experience of two prepayment plans in Washington, D. C.—Group Health Association and Group Hospitalization, Inc. Group Health is a consumer cooperative health plan which provides comprehensive health service to its members.

insurance. Under this program, which began operation in January 1947, each adult in the Province is required to pay a tax of $10 a year, and $5 a year for each dependent child under 18, the maximum tax for a family being $30.00. The tax for social welfare cases is paid by the governmental agencies responsible for their care. Covered persons—almost 95 percent of the total population—are entitled to virtually complete hospital care in ward accommodations whenever such care is necessary and for as long as necessary. If hospitalized outside of the Province, they are entitled to a payment of $5 a day toward their hospital bill for a maximum of 60 days.

The experience thus far under this program is as follows:[13]

Hospitalization rates per 1,000 beneficiaries*

Year	Discharges	Average days of stay per case	Days of care for discharged cases[14]
1947	156	10.0	1,565
1948	178	10.5	1,875
1949	200	10.3	2,048
1950	203	10.8	2,197
1951	199	11.1	2,201

*Excluding newborns.

The number of hospital cases and the volume of care provided in relation to the population is greater by far than that experienced in any State in this country. In considering whether these rates give a valid indication of the volume of hospital service which would be

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medical service being provided by a staff of physicians employed on salary. These physicians are fully aware of the financial status of the organization and in a sense have an interest in holding hospitalization to a minimum. Group Hospitalization is the Washington, D. C., Blue Cross plan. Group Health provides its members with hospitalization for a maximum of 90 days per member in any one year and a maximum of 90 days for any one illness over any period of time. Group Hospitalization provides its members with 30 days of care per certificate year plus an additional 180 days at half rates.

The hospitalization utilization experience of the two plans in 1951 was as follows:

Group	Days of service per 1,000 beneficiaries: Group Health Assn.	Group Hospitalization Inc.
Children under 18	280	295
Adult males	540	596
Adult females	1,030	1,165
Total	640	734

Any comparison of this sort is necessarily rough. It is affected by differences in the duration of hospital benefits, and the age distribution of the subscribers. It is apparent that the utilization rates under the two plans are fairly close, thus casting doubt on the idea that there is any appreciable volume of unnecessary hospitalization under the Washington, D. C. Blue Cross plan.

[13] *Annual Report of the Saskatchewan Hospital Services Plan, 1951, p. 10.*

[14] In this reckoning the total days of care for any discharged case are counted in the year in which the case was discharged. This tends to result in a slight understatement of the volume of care provided in the first 2 or 3 years of the program. In terms of total days of care provided in each year, irrespective of year in which discharged, the experience has been as follows: 1947, 1,678; 1948, 1,920, 1949, 2,095, 1950, 2,235; 1951, 2,209.

utilized in this country under conditions in which all economic barriers to hospitalization were removed, a number of factors must be borne in mind:

1. Saskatchewan is a highly rural province; over 80 percent of the population lives in the open country and in places of less than 2,500 population. The population density of the Province is only about 3 persons per square mile, less than all but two of the States in this country. (About half of the Province is virtually uninhabited. The density in the populated part of the Province is about 6 persons per square mile). In the opinion of some connected with the Saskatchewan program, the highly rural character of the Province makes for relatively high hospitalization rates, in that the huge distances make it virtually impossible for country physicians to make many home calls or for ill persons to come to the physician's office, and thus leads to hospitalization in certain cases which otherwise would receive care in the home, office, or out-patient department. The fact that in the winter the rural roads are frequently closed is also thought to lead to an increased rate of hospitalization.[15] Even before the inception of the hospital insurance program the hospitalization rates in Saskatchewan were considerably above the average rates in this country. Thus in 1945 the total days of hospitalization amounted to 1,260 per 1,000 population and in 1946 to 1,430 days per 1,000. These same rural and climatic conditions may also play a part in the relatively high utilization rates in North and South Dakota and Montana.

2. Undoubtedly under the program at present the hospitals in Saskatchewan are providing a certain volume of care which in the United States is provided in nursing homes. Other than nursing homes which care for acutely ill and maternity patients (the Saskatchewan Department of Health designates all hospitals of less than 10 beds as "nursing homes"), there were in the Province in 1950 only 8 nursing homes. These had a total of 253 bed patients; in addition homes for the aged had 33 bed patients.[16] Thus the number of bed patients in institutions which provide a domiciliary type of care is relatively small in relation to the total number of hospital beds in the Province. Certainly the ratio—about 5 percent—is much smaller than that which holds in this country.

The idea that in Saskatchewan a sizable proportion of cases are

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[15] However, a recent analysis of the hospitalization experience fails to verify this opinion. The analysis does show that the admission rate (after adjustment for age and sex) is somewhat higher in the rural areas than in the cities. However the cities have a greater proportion of long stay cases, with the result that the days of hospitalization (adjusted for age and sex) are practically the same for rural and urban areas. See: *Hospitalization Among Residents of Urban and Rural Communities*, a paper presented to the Canadian Public Health Association on June 18, 1952, by G. W. Myers, Executive Director, Saskatchewan Hospital Services Plan.

[16] Saskatchewan Health Survey Committee. *Saskatchewan Health Survey Report: Vol. II, Hospital Survey and Master Plan.* Regina, 1951, p. 28.

receiving hospital care who elsewhere would be receiving care in nursing homes was borne out by a special study made by the Saskatchewan Health Survey Committee of a sample of long stay cases (patients who had been in the hospital over 21 days).[17] These patients were occupying 28.7 percent of all beds in the hospitals studied. Of the 367 cases under review, 44 percent were acutely ill or convalescent and 55 percent were chronically ill. While almost one half of the cases were in need of active medical care and another 17 percent needed to be within reach of a doctor, one out of four of the long stay cases either was not receiving medical care or was not benefiting from medical care in a hospital.

"One third of the long stay cases required professional nursing service in a general hospital or facility associated with a general hospital. Almost 40 percent required supervised non-professional nursing care. Ten percent could have been discharged to their homes if a visiting nurse service had been available. Fifteen percent needed no nursing care."[18]

In brief, the conclusion was reached that over half of these cases (197 out of 367) did not need the intensive care of an acute general hospital; that 72 cases could have been cared for in convalescent or chronic facilities associated with a general hospital, that an additional 44 could have been cared for in a chronic facility not associated with a general hospital, that 16 could have been cared for in a home for the aged and that 65 could have been cared for in their own or a foster home, provided—in most cases—that a visiting nurse or home care service were available.

One conclusion to be drawn from all this is that under a program under which all needed hospital care is made available to all of the population a substantial number of cases not needing intensive hospital care will tend to become lodged in hospitals unless substitute facilities or services are made available.

3. The relatively large number of hospital beds in the Province may have tended towards a relatively high rate of utilization. The Plan has found that as the number of beds in the Province has increased, these beds are quickly occupied and in the endeavor to control the overall costs of the program an effort is now being made to hold the number of beds to a reasonable level. Saskatchewan now (1950) has 7.7 beds set up and in use per 1,000 population (exclusive of Federal hospitals and tuberculosis and mental hospitals). It is estimated that 7.5 beds would be sufficient to meet all needs. In those areas where the supply of beds has been especially excessive the utilization of care has been high.

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[17] *Ibid.*, p. 25.
[18] *Ibid.*, p. 26.

4. The former method of payment of hospitals for their services may also have encouraged unduly high utilization. Formerly hospitals were paid for each day of service in an amount equal to their per diem cost of operation. This may have encouraged hospital authorities to keep their beds fully occupied. The present method of paying hospitals—introduced in January 1951—was designed to reduce any such pressure and it is understood that it is proving effective. Hospitals are now paid specified amounts per bed annually for their maintenance and relatively small amounts for each day of care provided to Plan beneficiaries.[19]

5. It has been suggested that the hospitalization experience in Saskatchewan is higher than would be experienced if the program included the provision of comprehensive physicians' service. The reasoning here is that ambulatory patients may come into the hospital for diagnostic services, because as in-patients they can receive these without direct cost. If the same services were available without cost in the out-patient department or physician's office, these patients, it is argued, would receive these diagnostic services without in-patient care. If this reasoning is sound, there may be other factors which tend to offset this tendency. At any rate, the available data do not bear it out. One region of Saskatchewan (Swift Current) has a compulsory medical insurance program, covering physicians' services in the office, home, and hospital. The hospital utilization (discharge) rates in this region appear to be somewhat higher than those for the Province as a whole.[20] However this region is also considered to have an excessive number of beds which may affect the utilization rate.

Experience Under the British Columbia Hospital Insurance Service

Since January 1, 1949, a Province-wide hospital care insurance plan has been in effect in the Province of British Columbia, Canada. Under this program, all residents in the Province, with the exception of persons protected through a Federal plan or those insured under approved private hospital insurance plans, are required to participate. In excess of one million persons—about 90 percent of the total population of the Province—participate.

The premium rates now in effect (since July 1, 1952) are $27 for a single person and $39 for the head of a family with one or more dependents. Participants hospitalized within the Province receive, in ward accommodations, all needed hospital services, i. e., all the

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[19] Roth, F. B.; Myers, G. W.; Mott, F. D.; and Rosenfeld, L. *The Saskatchewan Experience in Payment for Hospital Care*, a paper presented at the 1952 convention of the American Public Health Association.

[20] *Annual Report of Saskatchewan Hospital Services Plan, 1951*, pp. 20, 72–81. Page 67 of the *Hospital Survey and Master Plan* shows the boundaries of the Swift Current region. Almost three-fourths of the rural municipalities in the region have discharge rates above those for the Province as a whole.

service normally provided by the hospital. In the event of hospitalization outside of the Province benefits are limited to an allowance against the bill of up to $8 a day (for adults) for not more than 30 days.

Care is provided in acute illness and in the acute phases of chronic illness without limitation on length of stay. However, care is not provided for so-called chronic cases, i. e., cases not requiring the services of an acute general hospital.

Since July 1, 1952, hospitalized patients are required to pay directly to the hospital $1 for each day of care received. This provision superseded a "co-insurance" provision, in effect since April 1, 1951, under which a single person or the head of a family had to pay stipulated amounts (ranging from $2 to $3.50 per day depending upon the per diem costs of the hospital) for the first 10 days of care received in any one year by him or any member of his family. (No more than 10 days' care in any one calendar year had to be paid for irrespective of how many times the member or one or more of his dependents was hospitalized.) [21]

The utilization under this program in the 3 years that it has been in effect has been as follows: [22]

Year	Cases discharged per 1,000 covered population	Average length of stay	Days of care per 1,000 covered population
1949	149.1	10.04	1,497
1950	154.7	10.12	1,566
1951	159.0	9.75	1,550

Under this program the admission (or discharge rate) is 22 percent less, the average length of stay 15 percent less, and the days of service 30 percent less than in Saskatchewan. In comparison with this country, however, the British Columbia rates are distinctly higher, and are exceeded only in the States of New York, Delaware, and Montana.

In considering whether the British Columbia experience indicates the volume of service which would be utilized in this country if all medical needs were met, again a number of factors must be held in view:

1. The climate in the more settled parts of British Columbia

[21] Both the present $1 a day provision and the former co-insurance provision were designed to keep the costs of the scheme within what were considered to be reasonable limits. The co-insurance provision was quite unpopular and was a prime issue in the provincial elections in the late spring of 1952. The change to the present provision was made by the new government then elected.

[22] Province of British Columbia. *Third Annual Report B. C. Hospital Insurance Service, 1951.* Victoria, 1952, p. 17. The discharge rate has been calculated from the figures given for days of care per 1,000 population and average length of stay. The data are exclusive of admissions and days of care for newborn infants.

is more temperate than in Saskatchewan and more nearly approaches that which prevails in the northern half of this country. While parts of British Columbia are extremely sparsely settled, the majority of the population is concentrated in the southern area where the population density is fairly high. Over half of the population is urban according to Canadian census definitions, i. e., lives in cities, towns, or incorporated villages. The temperate climate of the southern part of the Province is attractive to old people, and in 1941 8.3 percent of the population was 65 and over, as compared with 6.8 percent in the United States in 1940. This age differential would indicate a slightly greater need for hospital care, but the difference is so slight it may be disregarded.

2. During three-fourths of 1951 the co-insurance provision was in effect under which a single individual or family head had to pay $2 to $3.50 for the first 10 days of hospitalization of himself or family unit. This payment would certainly operate to keep out of hospitals persons who did not really need hospital care. On the other hand, it may also have operated to keep out of hospitals people who really did need care. To what extent, if at all, it did so operate there is no way of telling.

3. This program, as presently constituted, intends to provide care only for acute illness and the acute phases of chronic illness; it does not intend to provide care for chronically ill persons who do not require the type of care or medical treatments which an acute general hospital furnishes.[23] It would appear fairly certain that this program is not providing nearly as much bed care for long term chronically ill persons as the Saskatchewan program. One indication of this is that while in Saskatchewan the volume of bed care in nursing homes (i. e., those caring for chronic patients) is very small in relation to the total number of hospital beds, in British Columbia the number of beds in proprietary hospitals and nursing homes furnishing "medical, chronic, and convalescent care" was, in 1948, equal to 13 percent of the total bed capacity of all so-called public hospitals, i. e., nonprofit and publicly owned hospitals receiving provincial grants.[24] Another proof of the greater amount of care provided for the long term chronically ill in Saskatchewan than in British Columbia is the fact that in Saskatchewan 13.8 percent of all days of care in 1951

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[23] Hospitals send in admission notices on all BCHIS patients, giving diagnosis. In the case of those patients where the diagnosis indicates that the patient may be suffering from a non-acute chronic disease, a letter is sent to the hospital requesting additional information. If no reply is received or if the hospital submits no evidence (including a description of the "treatments being administered necessitating retention in an acute general hospital", signed by the attending physician) showing the need for acute general hospital care, the insurance program after appropriate notification ceases to provide further coverage. It has been found that termination of payment usually results in the patient being discharged since the service required can usually be obtained at a more reasonable rate in another institution. (Letter to L. S. Reed from L. F. Detwiller, Commissioner, B. C. H. I. S., Sept. 29, 1952, and accompanying material.)

[24] Province of British Columbia, Department of Health and Welfare. *Report on Hospital Statistics and Administration of the "Hospital Act," 1948.* Victoria, 1949, pp. 19, 42.

were for cases which stayed in the hospital 90 days or longer,[25] whereas in British Columbia only 7.4 percent of the total days of care were for such cases.[26]

An Estimate of the Volume of Service Needed

The five bodies of experience discussed above provide the following indices of the volume of hospital and nursing home service needed by a population:[27]

	Days of care per 1,000 population				
	Short term hospitals	Long term hospitals	All hospitals	Nursing homes	Total
9 States where over 98.5 percent of births take place in hospitals	1,128	262	1,390	475	1,865
12 States with highest per capita income	1,064	246	1,310	438	1,748
Blue Cross, adjusted	1,256	-----	-----	-----	-----
Saskatchewan	-----	-----	2,201	(*)	2,201
British Columbia	1,550	-----	-----	-----	-----

* There is little nursing home care beyond that included in the hospital utilization figure.

The differences among these experiences are perhaps not at great as appears on the surface. In the States where most births take place in hospitals and in the most prosperous group of States there is a considerable volume of care in nursing homes. The addition of the estimated volume of this care to the hospital care appreciably narrows the gap between the overall utilization in these States and that in

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[25] *Annual Report of the Saskatchewan Hospital Services Plan, 1951,* and additional data supplied by Mr. G. W. Myers, Executive Director.

[26] From dittoed tables "Cases Discharged by Length of Stay According to Specified Age Groups and Marital Status, 1951," made available through British Columbia Hospital Insurance Service. The data are for all British Columbia "Public" hospitals, not simply for cases or days paid under the program.

[27] The reader may question why the so-called bed-death ratio is not used for a determination of the volume of hospital service needed. Use of the bed-death ratio in determining the volume of hospitalization needed offers about the same advantages as the use of the volume of service received per 1,000 population in the States ranking high either in income or hospital usage. Actually the principle is substantially the same in either case, i. e., the estimate is based on the rate at which hospitals are used in selected States. In the case of the bed-death ratio the prime factors in the formula are (a) the days of general hospital care for each death occurring in a general hospital, and (b) the proportion of deaths which should occur in hospitals. There is no way, apparently, of determining the proportion of deaths which should occur in hospitals under a situation in which all health needs are met. Generally the users of the formula set the ratio at 50 percent of all deaths—the rate found in the States with the highest incomes and highest hospital utilization rates. Hence the principle is the same as that of basing estimated need on the current rates of hospital usage found in selected States. Although the bed-death ratio offers no new clue to the volume of hospital service required by the population as a whole, the formula may have decided value for determining the need of a particular area for hospital service, inasmuch as there is a correlation between the volume of service which will be used and the number of deaths occurring in hospitals, and since census data provide information on the number of deaths among the residents of particular areas.

Saskatchewan, where apparently the program is providing care in hospitals to many invalid patients who in this country would be cared for mainly in nursing homes. Similarly some of the difference between Saskatchewan and British Columbia is apparently due to the fact that the former is providing care to invalid, chronic patients who don't need intensive medical service but do need bed and nursing care, while the latter does not, or at least not to the same degree.

It is obvious from all this that part of the problem of determining the volume of hospital service needed by a population is the matter of definitions: of defining a "hospital" and "hospital care." It is apparent that in some places long term, chronically ill patients are being provided with bed care in places called nursing homes and that this care does not enter into the statistics of hospital care, while in other places the same type of care for the same type of patient is provided in places called hospitals and is considered hospital care. Any estimate must take this fact into account and define its term closely.

It is also obvious from the range in the various experiences that it is impossible, at least on the basis of existing data, to define with any exactitude the volume of hospital service needed. The need can be fixed only within approximate limits, and if one uses a single figure rather than a range to define the general level, it is only for reasons of convenience in the handling of data. Also it must always be borne in mind that the need for service is not fixed but varies with changes in medical arts, the development of alternative methods of meeting needs, changes in the age distribution of the population and various other factors.

Of the various experiences considered, it seems probable that the volume of care presently utilized in the two groups of States in this country falls short in some degree of the volume of service needed. There are two reasons for so believing. First, there is a considerable range in the volume of service being utilized by different States in each of the two groups, and the volume of service being utilized in the States with the highest rates is considerably above the average for each group. Second, there must be many people within these States who are deterred by economic considerations from obtaining all the hospital (and/or nursing home) service that they need. Probably at least 35 percent of the people in these States have no hospital insurance of any kind, and many who have insurance are eligible for such limited benefits that the cost of care is still a strong factor in determining their use of hospitals. Probably the economic barriers to receipt of needed care are greatest for persons needing long continued care. The high cost of hospital or nursing home care makes such care prohibitive for many individuals.

The adjusted Blue Cross experience, it would appear, falls considerably below indicating true need for both short and long term

care. Apparently this experience tends to represent the volume of service utilized by an employed, self-supporting population. It is probable that the adjustments made did not take sufficient account of the large volume of hospital-nursing home care required for the chronically ill and the aged who are underrepresented in Blue Cross enrollment.

The Saskatchewan experience reflects the volume of service utilized by a population for which all economic deterrents to receipt of hospital care, per se, have been removed. However economic deterrents to receipt of physicians' service are still operative for a good part of this population, and may tend to lessen the volume of hospital service demanded. Because of the extreme rural character of the Province and unusual climatic conditions, the experience may not furnish a safe guide for this country.

The British Columbia experience may fall short of reflecting true need, both because some economic deterrents to receipt of care were operative, and because the program does not fully meet the needs of the long term, chronically ill not requiring service in general hospitals.

The dangers of encouraging overbuilding, the great potentialities of home care programs for reducing the need for hospital care, and the incompleteness of the data on which decisions must be based, all point towards the desirability of conservatism in making estimates of bed needs.

In making such estimates, it is well not to speak in terms of acute and chronic illness for such terms are largely misleading. What one needs to know is the volume of service required in institutions (one may call them hospitals) which are equipped and staffed to provide diagnosis and medical treatment to ill persons; and secondly the volume of care required in institutions (be they called hospitals, nursing homes, or infirmaries) which are equipped and staffed to provide nursing care, but not intensive medical treatment, to ill persons.

The making of such estimates is a matter of judgment and individuals may differ in the conclusions drawn from the available data.

On the basis of all the data one may conclude that the population of this country will need at least 1,200–1,300 days of service annually per 1,000 population in hospitals equipped and staffed to provide diagnosis, treatment and rehabilitation, i. e., care needed by rather acutely ill (from acute or chronic disease) persons who need the type of intensive care that a well-equipped hospital is able to give. This estimate is founded largely on the present short term hospital utilization in the two groups of States considered and the adjusted utilization under Blue Cross.

Beyond this volume of care a very substantial volume of care for long term cases not needing active medical treatment will be required. It is suggested that this volume of care may well be in the neighbor-

hood of 700–800 days of service annually per 1,000 population. This estimate is founded on the fact that in the two groups of States considered, the present volume of long term care in hospitals and nursing homes is 684 and 737 days, respectively, annually per 1,000 population. The considerable growth of nursing homes in recent years and the high occupancy rate in these homes probably indicates some shortage of these facilities. The fact that there appear to be considerable numbers of elderly persons in mental hospitals who could be better cared for in local hospitals and nursing homes indicates a probable need above the recent levels of usage of nursing homes and long term hospitals. Pulling in the opposite direction is the possibility that considerable reductions in the need for institutional care may be made through development of home care programs.

To what degree services for long term chronic patients should be provided in general hospitals, in chronic disease hospitals, in nursing homes or similar facilities is a problem to which no answer is here attempted. In general it is believed that all chronic disease hospitals and nursing homes should be affiliated with or under the control and supervision of general hospitals, so that provision may be made for ready transference of patients from one level of care to another as their needs require.

There are many who believe that all or a substantial portion of chronic long term patients (perhaps they would except aged patients for whom possibilities of improvement or cure are small) should be cared for in general hospitals. To the extent that this occurs, the need for general hospital beds will be increased beyond the estimate indicated above.

In addition to the volume of care indicated above, it should be clearly understood that there will be needed a considerable volume of care in old age homes and other domiciliary institutions for the aged and infirm. No estimate as to the volume of such care is made. However, the volume of such care in the two groups of States considered is presently 475 and 438 days per 1,000 population respectively. One may doubt that the need will be below this, i. e., about 1.3 persons per 1,000 population in old age homes and similar facilities.

When one considers that the 700–800 days of care per 1,000 population estimated to be needed for the care of long term cases in general hospitals, chronic disease hospitals and nursing homes is required largely for persons over 65, and adds to this the substantial volume of domiciliary care in old age homes which is required, the whole problem of hospital and institutional care for the aged stands out in greater relief. This problem will grow constantly larger as the size of the aged group in the population increases. Society needs to be ingenious in developing measures which to the greatest possible extent will enable the aged to be cared for outside of institutions.

5. An Estimate of Beds Required

The number of beds required to provide some 1,200–1,300 days of hospital service annually for patients requiring active medical treatment and some 700 to 800 days of care for patients needing mainly nursing and personal care will depend upon the rate of occupancy of the respective facilities. As regards care for the first type of patient, during the past 3 years the occupancy rates of all non-Federal short term general hospitals have been as follows:[1]

	Occupancy rates		
	1949	1950	1951
Under 50 beds	61.4	55.1	57.6
50 to 99 beds	65.0	65.5	65.4
100 to 249 beds	77.4	77.9	75.1
250 beds and over	78.1	81.4	79.6
All hospitals	75.9	73.7	73.3

If we assume that it will be possible to operate the acute units of general beds at 75 percent of capacity, then the number of beds required to provide 1,200-1,300 days of service annually per 1,000 population will be 4.4 to 4.7 beds per 1,000.

This number may be taken as an average for the country as a whole. The need for beds will vary somewhat from State to State depending upon the average size of hospitals in the State. A rural State where the population is highly scattered will need to have a large proportion of its beds in relatively small hospitals and hence, since feasible occupancy rates in small hospitals are relatively low, will require more beds per 1,000 population than a State in which the population is largely urban and large hospitals are the rule. In 1951 the average of the occupancy rates of all non-Federal short term hospitals in the five most urban States was 77.1 and in the five most rural States was 63.5. If it be assumed that in the most urban States an average occupancy rate of 77 and in the most rural States an average occupancy rate of 65 are feasible, then it would appear that the number of acute beds would vary within limits of 4.3 to 4.6 for urban States and 5.1 to 5.5 for sparsely settled rural States.

As regards long term care, over the past 3 years the average occupancy of long term general hospitals (exclusive Federal) has been as follows: 86.0 percent in 1949, 84.9 percent in 1950 and 81.3 percent in 1951.[2] If it be assumed that a feasible bed occupancy rate for long-

[1] *Hospitals, Administrators Guide Issue,* June 1950, 1951 and 1952.
[2] *Ibid.*

term chronic patients (either in hospitals or nursing homes) is 85 percent, then it may be calculated that 2.3 to 2.6 beds per 1,000 population will be needed for this type of patient.

For both types of patients the need for beds would appear to be in the neighborhood of 6.4 to 7.3 beds per 1,000 population.

The above estimates are believed to be conservative. They indicate that the presently used ratio under the Hospital Survey and Construction program of 4.5 general hospital beds per 1,000 population is probably approximately correct. However this is so only when need is understood to include need for all civilian beds, not simply non-Federal beds. There are 64,000 Federal civilian general beds (mainly in Veterans Administration facilities)—0.42 per 1,000 population. At present the State agencies administering the Hospital Survey and Construction program exclude these beds from the count of existing facilities. As a measure of need for beds exclusive of Federal hospitals, the 4.5 ratio may be a little high.

The ratio of two chronic disease beds per 1,000 population, set forth in the Act, is probably an underestimation of the need. The country now has in its nursing homes considerably more beds for the care of the long term chronic patients than has been generally recognized. However relatively few of these beds are in facilities which meet accepted standards.

It is probable that the great majority of all care for long term chronic patients who do not need active medical treatment in a hospital will be required for elderly patients, i. e., those past 65. The proportion of the population that is 65 and over is constantly increasing. Furthermore there is considerable variation from one State to another in the proportion that the aged constitute of the total population. Accordingly it is suggested that it might be better for States and communities to calculate their need for long term facilities in terms not of the general population but the population 65 and over. Rates of 2.3–2.6 beds per 1,000 of the general population are at the present time equivalent to rates of 28 to 32 beds per 1,000 of the population 65 and over.[3]

The question of what types of institutions may best care for long term patients is one that is still unresolved. More and more the weight of authority seems to incline to the view that these patients should be cared for in general hospitals or facilities associated with general hospitals. Thus a well known authority in the field of care for chronic disease writes as follows:[4]

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[3] For example, New Hampshire has 10.9 percent of its population over 65; Alabama only 6.5 percent. On the basis of 2.45 beds per 1,000 of the general population, New Hampshire would need 1,301 beds; Alabama 7,328. On the basis of 30 beds per 1,000 of the population 65 and over, New Hampshire would need 1,740 beds, and Alabama 5,820.

[4] Bluestone, E. M. "The Chronics: They Belong in General Hospitals." *The Trained Nurse and Hospital Review*, January 1945, pp. 17–20.

The chronically ill exert a powerful claim on the attention of the medical scientist, for he is in the midst of a luckless clinical situation which is, however, of a challenging nature. . . . Patients whose illnesses take a long time to heal and patients whose illnesses take a long time to kill must never be subjected to the handicap of distance in addition to the handicap of time, for this would be the exact antithesis of every standard of scientific care . . . Interest in the long-term patient is the acid test for anyone connected with hospital service. . . . There is a dwindling minority which still feels that the uninteresting long-term patient is better off when he is divorced from the general hospital and placed in an independent institution for chronic disease (of which, by the way, there has been only one of high scientific standard which philanthropy has been willing to establish in all the world) even though it is relatively more expensive and more difficult to maintain him that way. But why should anyone believe or expect that the independent institution will be able to do as well or better for such patients than the general hospital with its favorable location, nearness of medical services and completeness of facilities. . . . The long-term patient, at a distance from the fountain-head of medical authority, is a reproach to science and philanthropy alike. . . . Long-term disease is more in evidence and has already emerged as an acute problem, comparable to the problem of infectious diseases in a former generation. All the more reason for revising our principles and practice of hospitalization.[5]

Whether long term patients who need only a nursing home type of care, i. e., who do not need intensive medical treatment but do need a great deal of nursing and personal care, should be cared for in general hospitals is problematical. Certainly such patients would not fare well intermixed among the generality of hospital patients, and it would be very expensive to care for them on this basis. On the other hand the present type of care that these patients are receiving in proprietary nursing homes frequently is quite unsatisfactory. In many cases the facilities are inadequate and possibly unsafe, and the actual care insufficient and substandard. It would seem desirable to bring this type of facility into affiliation with, or under the control and supervision of, hospitals. Perhaps ultimately the evolution will be towards hospitals developing separate annexes, located on the hospital grounds but physically separated from the main hospital, for provision of this type of care.

In considering the need for nursing home and hospital beds for long term cases, it should be recognized that some of these cases can be cared for in the patient's home if appropriate services are made available in the home. Many hospitals are experimenting with home care programs and the results are encouraging. The extent to which such programs can save hospital beds is one of the unknowns in any attempt to estimate the need for hospital-nursing home care.

In considering the need for service, one must always bear in

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[5] Under the Hospital Survey and Construction program, of all beds specifically designed to serve the chronically ill, almost as many have been built or planned for in general hospitals as in separate chronic disease hospitals. As of December 31, 1952, of 5,133 beds in approved projects for chronic disease patients, 2,151 are located in general hospitals, 220 in mental or tuberculosis hospitals, and 2,762 in chronic disease hospitals.

mind that to some degree one type of care or facility can be substituted for the other. If the needed type of facility is not available, people may be able to obtain care in another type of facility less appropriate to their need. Thus it is probable that today many long term patients are being cared for in general hospitals who could be cared for as well or better, and certainly much less expensively, in a nursing home type of facility. Similarly there may be some people in nursing homes, who are "buried" there, and who greatly need the rehabilitation services of a hospital. Again people are being cared for in hospitals or nursing homes, who might be cared for better and less expensively at home, if visiting nurse services were provided or various other services were extended into the home from the hospital.

It is highly probable that the needs estimated herein will not be fully met apart from the extension to virtually the entire population of some form of prepayment providing comprehensive hospital care. Under such a situation, if the prepayment provides care only in hospitals, and not in nursing homes, it will draw into hospitals a great many aged, chronically ill patients who could be cared for less expensively in nursing homes.

It is suggested that the general hospital should be thought of as potentially capable of providing many different levels of service. Extremely ill acute cases need one level of service; less ill acute patients another level; convalescent patients still another; the long term chronic sick still other levels of service. Some of the levels of service for these last may best be provided in the nursing home annex of the hospital or in the patient's home. A wise use of resources is made when patients are provided with care at levels appropriate to their needs. Artificial restrictions on the change of patients from one level of care to another, may result in people going without care, or receiving care at undue cost.

6. Conclusions

Any estimate of the number of hospital beds required for adequate health care of the population is rendered difficult by vagueness of the terms hospital and hospital care. There is no sharp line of demarcation between hospitals and nursing homes and between nursing homes and old age homes.

On the basis of the current levels of service for various population groups, it is estimated—and such estimations are no more than approximations—that the population will need about 1,200–1,300 days of service in hospitals equipped and staffed for the provision of diagnosis and medical treatment, and an additional 700–800 days of care per 1,000 population in facilities designed to provide nursing care, but little active medical treatment. Whether such service should be provided in general hospitals, chronic disease hospitals or nursing homes is something on which no opinion is here ventured. However it would seem that all facilities providing long term care should be affiliated with or under the control and supervision of general hospitals in order that there may be ready transference of patients from one type of facility to another as the necessities of their care demands. Only under such arrangements would it be possible for individuals to always get the type of care that they needed.

The provision of this volume of service would require in the neighborhood of 4.4 to 4.7 hospital beds for persons needing diagnosis and active treatment and another 2.3 to 2.6 beds per 1,000 population in general hospitals, chronic disease hospitals and nursing home type facilities for persons needing nursing and convalescent care but not active medical treatment. Inasmuch as the vast majority of such beds are needed for the care of elderly people, it would be more accurate to express the need for such beds in terms of the population 65 and over. The estimated need is 28 to 32 beds per 1,000 of this population.[1]

The above estimates are believed to be conservative. They indicate that the presently used ratio under the Hospital Survey and Construction Act of 4.5 general beds per 1,000 population is probably approximately correct, or perhaps a little too high if Federal civilian beds (there are about 0.4 such beds per 1,000 population) are to be excluded from the count of existing facilities. The ratio of 2 beds per 1,000 for long term cases is probably low.

Perhaps it would be well to make crystal clear the nature and meaning of these conclusions. The estimate of beds needed is designed to represent the number of beds that is required, on the average, to meet the medical needs of the population. It does not represent the

[1] In addition a substantial number of beds in old age homes for aged persons requiring only domiciliary care will be needed.

number of beds that any community should build up to, for there may be a great difference between what a community needs and what it can support under given conditions of income level and methods of financing hospital care. Further, not every community or hospital service area needs this number of beds; metropolitan areas will need more, rural areas considerably less, depending upon the extent to which people must go outside their home hospital service areas for care.

Suggested Additional Studies

It must be evident that the pursuit and capture of valid conclusions as to the volume of general hospital service needed by the population and the number of beds necessary to supply this service is both important and difficult. In developing this paper, it became increasingly apparent that more study and investigation is required for the development of valid answers. Some of the studies which would be helpful are as follows:

1. Nursing homes and relationships to hospitals

How many nursing homes and beds are there in each State? What is the admission rate and average census for these facilities? What is the distribution of patients according to age and diagnosis classification, the extent to which bed-ridden, and the type and amount of medical and nursing service required? What proportion of the patients require care for social rather than medical reasons, i. e., lack of a home, no spouse or relative to provide simple care? What proportion of the patients would benefit by care in a general hospital? What proportion of the patients would tend to be cared for in general hospitals, if general hospitals had facilities for long term chronic patients, and if the cost of care were financed through prepayment?

2. Long term patients in hospitals

How many long term patients are there in general and chronic disease hospitals? What is the distribution of these patients according to age, diagnosis, and type of medical treatment and nursing service required? What proportion of these patients would be just as well off in nursing homes or equivalent facilities?

3. Detailed study of the utilization of Blue Cross plans

It is understood that the plans have widely differing admission and utilization rates. What are the variations among the plans? To what extent are these differences explained by variations in benefits (limits on days of hospitalization, etc., types of cases excluded, etc.)? In what diagnostic classifications do the real differences (after account is taken of those due to benefit provisions) tend to appear?

4. **Detailed study of the utilization experience under the Saskatchewan and British Columbia plans**

As the most comprehensive prepayment programs on the North American continent with universal coverage, much can be learned from those programs as to the amount of service utilized by a population when all cost barriers are removed.

5. **Hospital utilization among various insured groups**

To what extent are there differences in utilization (other than those due to age and sex) among groups within the same prepayment plan? Do high income groups use more service than low income groups? Do rural subscribers use more or less service than urban ones? What is the effect of educational level upon hospital utilization?

6. **Variations in hospital utilization among different parts of country**

What explains the differences in hospital utilization between, New York and Oregon, both with relatively high incomes? Are people in New York receiving more than is necessary, those in Oregon too little? In what diagnostic classification do the differences tend to appear?

7. **Variation in hospital utilization with differences in prepayment coverage of physicians' service**

What effect does coverage of physicians' service have on hospital utilization under prepayment? The Blue Cross directors believe that hospital utilization goes up and stays up when Blue Cross subscribers receive surgical and in-hospital medical coverage. Does it continue to go up, or decline, if comprehensive physicians' service is made available on a prepayment basis?

8. **Unnecessary utilization under insurance programs**

What proportion of the hospitalization under various insurance programs is unnecessary? If careful medical review were made how many cases would it have been found that the patient could have been cared for just as well without in-patient care? In how many cases was the stay longer than necessary? Were there cases in which the patient went home too soon?

9. **Effect of regional coordination on hospital occupancy and utilization**

To what extent would effective regional coordination among hospitals permit an increased average level of occupancy? To what extent would such coordination, by improving the level of quality of care, increase or decrease utilization?

10. Maximum practical occupancy rates

If it were practical to operate the country's general hospital plant at an average occupancy rate of 80 percent instead of 75 percent, the need for beds would be reduced by about 0.29 of a bed per 1,000 population, or about 43,000 beds for the country as a whole. What are the maximum effective occupancy rates for hospitals of different size? How can present occupancy rates be increased, without harm to the quality of service, so that a given hospital plant can provide a greater volume of patient care?

APPENDIX A.—*General (Acute) and Chronic Beds in Non-Federal Hospitals, by Region and State, 1952 (Includes Both Acceptable and Nonacceptable Beds)*

Region and State	General beds		Chronic beds		General and chronic beds		Percent chronic to total general and chronic
	Number	Per 1,000 population	Number	Per 1,000 population	Number	Per 1,000 population	
United States	552, 129	3. 65	61, 091	0. 41	613, 220	4. 06	9. 96
New England	37, 044	4. 00	8, 158	. 88	45, 202	4. 89	18. 05
Maine	3, 433	3. 88	152	. 17	3, 585	4. 05	4. 24
New Hampshire	2, 073	3. 90	40	. 08	2, 113	3. 98	1. 89
Vermont	1, 474	3. 96	50	. 14	1, 524	4. 10	3. 28
Massachusetts	19, 955	4. 27	3, 845	. 82	23, 800	5. 09	16. 16
Rhode Island	2, 392	3. 12	1, 337	1. 74	3, 729	4. 86	35. 85
Connecticut	7, 717	3. 81	2, 734	1. 35	10, 451	5. 16	26. 16
Middle Atlantic	123, 168	4. 05	11, 681	. 38	134, 849	4. 43	8. 66
New York	64, 912	4. 34	8, 386	. 56	73, 298	4. 90	11. 44
New Jersey	17, 391	3. 55	1, 570	. 32	18, 961	3. 87	8. 28
Pennsylvania	40, 865	3. 89	1, 725	. 16	42, 590	4. 05	4. 05
East North Central	104, 677	3. 40	11, 224	. 37	115, 901	3. 77	9. 68
Ohio	26, 412	3. 28	1, 235	. 15	27, 647	3. 43	4. 47
Indiana	10, 753	2. 69	402	. 10	11, 155	2. 79	3. 60
Illinois	32, 691	3. 74	3, 823	. 44	36, 514	4. 18	10. 47
Michigan	22, 003	3. 37	1, 735	. 27	23, 738	3. 64	7. 31
Wisconsin	12, 818	3. 71	4, 029	1. 17	16, 847	4. 88	23. 92

West North Central	61,001	4.32	9,545	.67	70,546	4.99	13.53
Minnesota	12,860	4.30	803	.27	13,663	4.57	5.88
Iowa	11,087	4.23	6,304	2.40	17,391	6.63	36.25
Missouri	16,397	4.09	1,349	.34	17,746	4.43	7.60
North Dakota	3,195	5.29	110	.18	3,305	5.47	3.33
South Dakota	3,275	5.11	------	------	3,275	5.11	------
Nebraska	6,192	4.61	855	.64	7,047	5.25	12.13
Kansas	7,995	4.16	124	.06	8,119	4.22	1.53
South Atlantic	68,599	3.27	9,854	.47	78,453	3.74	12.56
Delaware	1,380	4.25	336	1.03	1,716	5.28	19.58
Maryland	7,411	3.14	6,102	2.59	13,513	5.73	45.16
District of Columbia	4,016	5.21	250	.32	4,266	5.53	5.86
Virginia	9,459	2.97	60	.02	9,519	2.99	.63
West Virginia	7,152	3.59	57	.03	7,209	3.62	.79
North Carolina	13,584	3.37	235	.06	13,819	3.43	1.70
South Carolina	6,381	3,12	452	.22	6,833	3.34	6.61
Georgia	9,588	2.82	1,351	.40	10,939	3.22	12.35
Florida	9,628	3.35	1,011	.35	10,639	3.70	9.50
East South Central	31,480	2.79	3,487	.31	34,967	3.10	9.97
Kentucky	7,931	2.80	349	.12	8,280	2.92	4.21
Tennessee	9,053	2.74	2,726	.83	11,779	3.57	23.14
Alabama	8,062	2.70	388	.13	8,450	2.83	4.59
Mississippi	6,434	2.97	24	.01	6,458	2.98	.37
West South Central	53,220	3.65	1,671	.11	54,891	3.76	3.04
Arkansas	7,071	3.74	------	-----	7,071	3.74	------
Louisiana	10,772	3.96	226	.08	10,998	4.04	2.05
Oklahoma	8,973	4.02	260	.12	9,233	4.14	2.82
Texas	26,404	3.41	1,185	.15	27,589	3.56	4.30

APPENDIX A.—*General (Acute) and Chronic Beds in Non-Federal Hospitals, by Region and State, 1952 (Includes Both Acceptable and Nonacceptable Beds)*—Continued

Region and State	General beds		Chronic beds		General and chronic beds		Percent chronic to total general and chronic
	Number	Per 1,000 population	Number	Per 1,000 population	Number	Per 1,000 population	
Mountain	23,536	4.56	535	.10	24,071	4.66	2.22
Montana	3,792	6.49	-------	-------	3,792	6.49	------
Idaho	2,417	4.11	53	.09	2,470	4.20	2.15
Wyoming	1,467	5.15	70	.24	1,537	5.39	4.55
Colorado	6,531	4.90	40	.03	6,571	4.93	.61
New Mexico	2,525	3.53	88	.12	2,613	3.65	3.37
Arizona	3,482	4.42	181	.23	3,663	4.65	4.94
Utah	2,476	3.52	103	.15	2,579	3.67	3.99
Nevada	846	5.10	-------	-------	846	5.10	------
Pacific	49,404	3.40	4,936	.34	54,340	3.74	9.08
Washington	7,964	3.40	635	.27	8,599	3.67	7.38
Oregon	5,109	3.30	-------	-------	5,109	3.30	------
California	36,331	3.41	4,301	.41	40,099	3.80	10.73

APPENDIX B.—General Hospital Beds[1] in Various Countries in Relation to Population

Country and date of information	General and special hospitals			Population
	Number	Bed capacity	Beds per 1,000 population	
Denmark, 1949	161	26,602	6.3	4,231,000
England and Wales, 1951	([2])	277,691	6.3	44,020,000
Sweden, 1950	371	43,884	6.3	7,017,000
New Zealand, 1950	354	[3] 14,487	7.5	1,920,000
Norway, 1949	287	17,662	5.5	3,232,000
Netherlands, 1949	263	40,845	4.1	9,956,000
Canada, 1948	987	84,991	6.4	13,227,000
German Federal Republic, 1950	2,752	381,833	5.5	69,000,000
Belgium, 1950	464	36,784	4.3	8,639,000
Spain, 1949	1,217	61,617	2.2	28,023,000
Finland, 1950	401	15,006	3.7	4,064,000
Ireland, 1951	369	17,755	5.9	3,006,000
Scotland, 1950	166	20,612	3.9	5,219,000

[1] Includes all hospitals except nervous and mental and tuberculosis hospitals.
[2] Not reported.
[3] Excludes beds occupied by tubercular patients Data from, New Zealand Department of Health *Annual Report of the Director-General of Health, 1951.*

SOURCE: United Nations World Health Organization *Statistics of Medical Personnel and Institutions and of Some Public Health Measures.* January 1952. 16 pp. (Medical Statistics Documentation II B)

Population data from United Nations *Statistical Yearbook, 1951.* New York: United Nations Publications, 1951. pp. 24–31.